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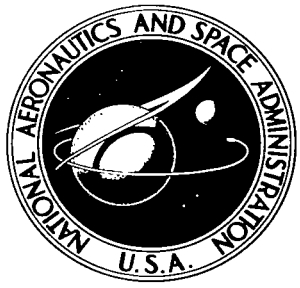

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by Ralph E. Graham, Robert H. Lamb, and Paul O. Romere

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SUMMARY

Equations have been derived and utilized to calculate the Newtonian aerodynamics of elliptical cones for cone cross-sectional thickness ratios ranging from 0.25 to 3.0 and for the complete range of bluntness. For each cross-sectional thickness ratio, the cones were blunted using prolate spheroids which were forced to be tangent to the cones.

The static longitudinal aerodynamics for angles-of-attack from 0° to 180° and directional stability derivatives at zero angle-of-attack are presented in tabular form.

It was found that for bluntness ratios less than or equal to 25 percent of maximum bluntness, the effects on the aerodynamics are small, but as the bluntness ratio increased above this value, the effects become more pronounced. For all configurations, increasing bluntness decreases the magnitude of normal-force and pitching-moment coefficients. Also, it was found that for all configurations an angle-of-attack exists at which axial force is independent of bluntness. Before this intersection point, axial force increases with increasing bluntness; however, after the intersection, axial force decreases with increasing bluntness.

INTRODUCTION

Studies of raked-off elliptical cones have given promise to their use as heat shields for vehicles returning to earth at hyperbolic velocities (refs. 1 through 5). Since these conical heat shields will usually be blunted, due

either to design or shape deformation caused by heating, a need has arisen to determine the hypersonic aerodynamics of blunted elliptical cones.

Equations were derived to determine the Newtonian aerodynamics of blunted right elliptical cones. A numerical technique was utilized to obtain coefficients for cones having cross-sectional thickness ratios of 0.25 to 3.0 with cone half-angles measured in the vertical plane varying from 20° to 60°. For each cross-section, the cones were blunted using prolate spheroids which were forced to be tangent to the cones and which were varied in shape to obtain configurations with sharp-to-maximally-blunted noses. The bluntness was varied in 25 percent increments of maximum bluntness. The static longitudinal aerodynamics for angles-of-attack from 0° to 180° and the static directional stability derivatives are presented in tabular form. The aerodynamic coefficients of the cone base are not included.

SYMBOLS

a	base semiheight of the elliptical cone configuration
b	base semiwidth of the elliptical cone configuration
C_A	axial force coefficient, $-F_X/qS$
C_D	drag coefficient, F_D/qS
C_L	lift coefficient, F_L/qS
C_ℓ	rolling-moment coefficient, M_X/qSL_R
C_m	pitching-moment coefficient, M_Y/qSL_R
C_N	normal-force coefficient, $-F_Z/qS$
C_n	yawing-moment coefficient, M_Z/qSL_R
C_p	elliptical cone pressure coefficient, $\frac{p - p_\infty}{q}$
C_p'	prolate spheroid pressure coefficient, $\frac{p - p_\infty}{q}$

C_Y	side-force coefficient, F_Y/qS
C_{n_β}	$\left.\frac{\Delta C_n}{\Delta \beta}\right\|_{\beta=0°}$, per deg
C_{Y_β}	$\left.\frac{\Delta C_Y}{\Delta \beta}\right\|_{\beta=0°}$, per deg
e	distance between X- and X'- axes, $X' = X + e$
F_D	drag force
F_L	lift force
F_X	force along X-axis
F_Y	force along Y-axis
F_Z	force along Z-axis
$\vec{i}, \vec{j}, \vec{k}$	unit vectors in the X-, Y-, and Z-directions, respectively
ℓ	x' distance from spheroid center to desired reference center
L_R	length of unblunted cone, reference length
L/D	lift-drag ratio, C_L/C_D
m	cone thickness ratio, $\frac{\tan \theta_{XZ}}{\tan \theta_{XY}} = \frac{a}{b}$
M_X	rolling moment
M_Y	pitching moment

M_Z	yawing moment
$\frac{\vec{n}}{\lvert\vec{n}\rvert}$	unit normal vector
p	local pressure
p_∞	free-stream pressure
q	free-stream dynamic pressure
r	nose radius
S	reference area, πab
S_x', S_y', S_z'	projected areas in the X'-, Y'-, and Z'-directions, respectively
$\frac{\vec{V}_\infty}{\lvert\vec{V}_\infty\rvert}$	unit free-stream velocity vector
X, Y, Z	Cartesian coordinate axes of elliptical cone
X', Y', Z'	Cartesian coordinate axes of prolate spheroid
x, y, z	distance along X-, Y-, and Z-axis, respectively
x', y', z'	distance along X'-, Y'-, and Z'-axis, respectively
α	angle-of-attack, deg
β	angle-of-sideslip, deg
η	angle between relative wind and surface normal, deg
θ_{XY}	cone half-angle measured in horizontal plane, deg
θ_{XZ}	cone half-angle measured in vertical plane, deg

ξ	percentage of maximum bluntness, $(r/2a)_{max}$
ρ	cylindrical coordinate length measured normal to X-axis
ϕ	cylindrical polar coordinate angle measured about the X-axis

Subscripts:

c	cone
L	lower
s	spheroid
t	tangent
U	upper

CONFIGURATIONS

An example of the configurations investigated is shown in figure 1 along with the axes reference system. The cone half-angles θ_{XZ} measured in the vertical plane varied from 20° to 60° in 10° increments. The cone half-angles θ_{XY} measured in the horizontal plane varied so that cone thickness ratios m of 0.25, 0.50, 0.75, 1.00, 1.50, 2.0, 2.50, and 3.00 were obtained. The cones were blunted using prolate spheroids which were forced to be tangent to the cones. The percentage of maximum bluntness ξ varied from 0 to 100 in 25 percent increments. For maximum bluntness the cone-prolate spheroid combination is a prolate spheroid segment. These combinations resulted in 200 configurations. Table I presents the bluntness ratios $\frac{r}{2a}$ which correspond to the values of ξ for all configurations investigated.

THEORY

The Newtonian pressure coefficient may be defined as

$$C_p' = 2 \cos^2 \eta \tag{1}$$

where η is the angle between the velocity vector and the normal vector to the local surface. A convenient manner of determining the angle η is to take the dot product of the unit velocity vector and the unit normal vector. From figure 1, the unit velocity vector may be defined as

$$\frac{\vec{V}_\infty}{|\vec{V}_\infty|} = -\cos \alpha \cos \beta \vec{i} - \sin \beta \vec{j} - \sin \alpha \cos \beta \vec{k} \tag{2}$$

The equation of the surface of a prolate spheroid whose circular cross section lies in the vertical plane may be written, after inspection of figure 2, as

$$x'^2 + m^2 y'^2 + z'^2 = r^2 \tag{3}$$

The unit normal vector $\frac{\vec{n}}{|\vec{n}|}$ may be written by normalizing the surface gradient

$$\frac{\vec{n}}{|\vec{n}|} = \frac{x' \vec{i} + m^2 y' \vec{j} + z' \vec{k}}{\sqrt{x'^2 + m^4 y'^2 + z'^2}} \tag{4}$$

It is convenient to transform the surface equation of the prolate spheroid into cylindrical coordinates. Using the relations

$$x' = x' \tag{5}$$

$$y' = -\rho \sin \phi \tag{6}$$

$$z' = -\rho \cos \phi \tag{7}$$

equation (3) becomes

$$x' = \sqrt{r^2 - \left(m^2\rho^2\sin^2\phi + \rho^2\cos^2\phi\right)} \tag{8}$$

Substituting equations (6), (7), and (8) into equation (4), taking the dot product of the result with equation (2), and letting

$$Q = -\cos \alpha \cos \beta \tag{9}$$

$$R = \sin \beta \tag{10}$$

$$S' = \sin \alpha \cos \beta \tag{11}$$

the final expression for the pressure coefficient over the surface of the prolate spheroid becomes

$$C_p' = \frac{2}{r^2 + m^2\rho^2\sin^2\phi\left(m^2 - 1\right)}\left[Q\sqrt{r^2 - \left(m^2\rho^2\sin^2\phi + \rho^2\cos^2\phi\right)}\right.$$

$$\left. + Rm^2\rho\sin\phi + S'\rho\cos\phi\right]^2 \tag{12}$$

The basic Newtonian force and moment equations are

$$C_N = \frac{1}{S}\iint C_p'\, dS_z' \tag{13}$$

$$C_A = \frac{1}{S}\iint C_p'\, dS_x' \tag{14}$$

$$C_Y = \frac{1}{S}\iint C_p'\, dS_y' \tag{15}$$

$$C_m = \frac{1}{SL_R}\iint C_p'\left(x' - \ell\right)dS_z' - \frac{1}{SL_R}\iint C_p' z'\, dS_x' \tag{16}$$

$$C_n = \frac{1}{SL_R}\iint C_p'\left(x' - \ell\right)dS_y' + \frac{1}{SL_R}\iint C_p' y'\, dS_x' \tag{17}$$

$$C_\ell = -\frac{1}{SL_R}\iint C_p' z'\, dS_y' - \frac{1}{SL_R}\iint C_p' y'\, dS_z' \tag{18}$$

Since only the portion of the body exposed to the flow contributes to the forces acting on the body, the limits of integration ϕ_1 and ϕ_2 must be determined as the points where the shading begins. These limits may be determined by setting $C_p' = 0$, yielding

$$\phi_{1,2} = \cot^{-1}\left\{ \frac{-S' R m^2 (r^2 - x'^2)}{\left[(S'^2 + Q^2)(r^2 - x'^2) - Q^2 r^2\right]} \right.$$

$$\left. \pm \sqrt{S'^2 R^2 m^4 (r^2 - x'^2)^2 - \left[(S'^2 + Q^2)(r^2 - x'^2) - Q^2 r^2\right]\left[(r^2 - x'^2)(R^2 m^4 + Q^2 m^2) - Q^2 r^2 m^2\right]} \right\}$$
$$(S'^2 + Q^2)(r^2 - x'^2) - Q^2 r^2$$

(19)

If in equation (19) the portion under the radical is less than zero, then $\phi_1 = 0$ and $\phi_2 = 2\pi$.

The generalized expressions for dS_x', dS_y', and dS_z' can be determined from the following relations:

$$dS_x' = dy' dz' = \begin{vmatrix} \frac{\partial y'}{\partial \rho} & \frac{\partial y'}{\partial \phi} \\ \frac{\partial z'}{\partial \rho} & \frac{\partial z'}{\partial \phi} \end{vmatrix} d\rho\, d\phi = -\rho\, d\rho\, d\phi$$

$$= \frac{x'}{\left(m^2 \sin^2\phi + \cos^2\phi\right)} dx' d\phi \qquad (20)$$

$$dS_y' = dx'dz' = \begin{vmatrix} \frac{\partial x'}{\partial x'} & \frac{\partial x'}{\partial \phi} \\ \frac{\partial z'}{\partial x'} & \frac{\partial z'}{\partial \phi} \end{vmatrix} dx'd\phi$$

$$= \frac{m^2\sqrt{r^2 - x'^2}\sin\phi}{\left[m^2\sin^2\phi + \cos^2\phi\right]^{3/2}} dx'd\phi \qquad (21)$$

$$dS_z' = dx'dy' = \begin{vmatrix} \frac{\partial x'}{\partial x'} & \frac{\partial x'}{\partial \phi} \\ \frac{\partial y'}{\partial x'} & \frac{\partial y'}{\partial \phi} \end{vmatrix} dx'd\phi$$

$$= \frac{-\sqrt{r^2 - x'^2}\cos\phi}{\left[m^2\sin^2\phi + \cos^2\phi\right]^{3/2}} dx'd\phi \qquad (22)$$

where

$$\rho = \sqrt{\frac{r^2 - x'^2}{m^2\sin^2\phi + \cos^2\phi}}$$

Using the basic Newtonian force and moment equations, (13) through (18), the expressions for the coefficients of the prolate spheroid may be written as follows.

$$C_N = \frac{-1}{S} \int_{x'_L}^{x'_U} \int_{\phi_1}^{\phi_2} \frac{C_p' \sqrt{r^2 - x'^2} \cos\phi}{\left[m^2 \sin^2\phi + \cos^2\phi\right]^{3/2}} \, d\phi \, dx' \tag{23}$$

$$C_A = \frac{1}{S} \int_{x'_L}^{x'_U} \int_{\phi_1}^{\phi_2} \frac{C_p' x'}{\left[m^2 \sin^2\phi + \cos^2\phi\right]} \, d\phi \, dx' \tag{24}$$

$$C_Y = \frac{1}{S} \int_{x'_L}^{x'_U} \int_{\phi_1}^{\phi_2} \frac{C_p' m^2 \sqrt{r^2 - x'^2} \sin\phi}{\left[m^2 \sin^2\phi + \cos^2\phi\right]^{3/2}} \, d\phi \, dx' \tag{25}$$

$$C_m = \frac{\ell}{SL_R} \int_{x'_L}^{x'_U} \int_{\phi_1}^{\phi_2} \frac{C_p' \sqrt{r^2 - x'^2} \cos\phi}{\left[m^2 \sin^2\phi + \cos^2\phi\right]^{3/2}} \, d\phi \, dx' \tag{26}$$

$$C_n = \frac{1}{SL_R} \int_{x'_L}^{x'_U} \int_{\phi_1}^{\phi_2} C_p' \frac{\left[m^2 \left(x' - \ell\right) - x'\right] \sqrt{r^2 - x'^2} \sin\phi}{\left[m^2 \sin^2\phi + \cos^2\phi\right]^{3/2}} \, d\phi \, dx' \tag{27}$$

$$C_{\ell} = \frac{1}{SL_R} \int_{x_L'}^{x_U'} \int_{\phi_1}^{\phi_2} \frac{\left(m^2 - 1\right) C_p' \left(r^2 - x'^2\right) \sin\phi \cos\phi}{\left[m^2 \sin^2\phi + \cos^2\phi\right]^2} \, d\phi \, dx' \tag{28}$$

where x_L' and x_U' are the lower and upper integration limits with respect to x', and ℓ is the x' distance from the moment reference center (see fig. 2) to the desired reference center.

Before equations (23) to (28) are combined with the equations for elliptical cones, it is necessary to insure that the prolate spheroid be tangent to the cone at all points on the spheroid-cone interface. Also, it is necessary to determine that location at which tangency occurs. For this analysis, the cone and the spheroid must both be based on the same axis system. Let e be the -x distance the center of the spheroid must be translated in order to be tangent to the cone (see fig. 3). The surface equation of a prolate spheroid whose circular cross section (radius r) lies in the XZ plane and whose center lies at a -x of e is

$$(x + e)^2 + m^2 y^2 + z^2 = r^2 \tag{29}$$

If the spheroid is to be tangent to the cone in the XZ plane, then

$$e = \frac{r}{\sin\theta_{XZ}} \tag{30}$$

The unit normal vector of the spheroid may be written

$$\frac{\vec{n_s}}{\left|\vec{n_s}\right|} = \frac{\left(x + \frac{r}{\sin\theta_{XZ}}\right)\vec{i} + m^2 y\vec{j} + z\vec{k}}{\sqrt{\left(x + \frac{r}{\sin\theta_{XZ}}\right)^2 + m^4 y^2 + z^2}} \tag{31}$$

Writing the equation of the cone surface as

$$x^2 \tan^2 \theta_{XZ} = m^2 y^2 + z^2 \tag{32}$$

the unit normal vector of the cone is

$$\frac{\vec{n_c}}{|\vec{n_c}|} = \frac{-x \tan^2 \theta_{XZ} \vec{i} + m^2 y \vec{j} + z \vec{k}}{\sqrt{x^2 \tan^4 \theta_{XZ} + m^4 y^2 + z^2}} \tag{33}$$

The unit normal vector for both the cone and the spheroid must be equal if they are to be tangent. Comparing equations (31) to (33), it can be seen that this is true if

$$-x \tan^2 \theta_{XZ} = x + \frac{r}{\sin \theta_{XZ}} \tag{34}$$

thus yielding tangency at $x_t = \dfrac{-r}{\sin \theta_{XZ} \sec^2 \theta_{XZ}}$ where x_t is measured from the theoretical apex of the cone (see fig. 3).

Taking the force and moment equations for elliptical cones from reference 3 and combining them with the prolate spheroid equations, the equations for blunted elliptical cones are as follows.

$$C_N = -\frac{1}{S}\int_{x'_L}^{x'_U}\int_{\phi_1}^{\phi_2} \frac{C_p' \sqrt{r^2 - x'^2}\cos\phi}{\left(m^2\sin^2\phi + \cos^2\phi\right)^{3/2}}\, d\phi\, dx' + \frac{1}{S}\int_{x_L}^{x_U}\int_{\phi_3}^{\phi_4} \frac{C_p x \tan\theta_{XZ}\cos\phi}{\left(m^2\sin^2\phi + \cos^2\phi\right)^{3/2}}\, d\phi\, dx \tag{35}$$

$$C_A = \frac{1}{S}\int_{x'_L}^{x'_U}\int_{\phi_1}^{\phi_2} \frac{C_p' x'}{\left(m^2\sin^2\phi + \cos^2\phi\right)}\, d\phi\, dx' - \frac{1}{S}\int_{x_L}^{x_U}\int_{\phi_3}^{\phi_4} \frac{C_p x \tan^2\theta_{XZ}}{\left(m^2\sin^2\phi + \cos^2\phi\right)}\, d\phi\, dx \tag{36}$$

$$C_Y = \frac{1}{S}\int_{x'_L}^{x'_U}\int_{\phi_1}^{\phi_2} \frac{C_p' m^2 \sqrt{r^2 - x'^2}\sin\phi}{\left(m^2\sin^2\phi + \cos^2\phi\right)^{3/2}}\, d\phi\, dx' - \frac{1}{S}\int_{x_L}^{x_U}\int_{\phi_3}^{\phi_4} \frac{C_p x m^2 \tan\theta_{XZ}\sin\phi}{\left(m^2\sin^2\phi + \cos^2\phi\right)^{3/2}}\, d\phi\, dx \tag{37}$$

$$C_m = \frac{e}{SL_R}\int_{x'_L}^{x'_U}\int_{\phi_1}^{\phi_2} \frac{C_p' \sqrt{r^2 - x'^2}\cos\phi}{\left(m^2\sin^2\phi + \cos^2\phi\right)^{3/2}}\, d\phi\, dx'$$

$$+ \frac{1}{SL_R}\int_{x_L}^{x_U}\int_{\phi_3}^{\phi_4} \frac{C_p \sec^2\theta_{XZ}\, x^2 \tan\theta_{XZ}\cos\phi}{\left(m^2\sin^2\phi + \cos^2\phi\right)^{3/2}}\, d\phi\, dx \qquad (38)$$

$$C_n = \frac{1}{SL_R}\int_{x'_L}^{x'_U}\int_{\phi_1}^{\phi_2} \frac{C_p' \left[m^2\left(x' - e\right) - \bar{x}'\right]\sqrt{r^2 - x'^2}\sin\phi}{\left(m^2\sin^2\phi + \cos^2\phi\right)^{3/2}}\, d\phi\, dx'$$

$$- \frac{1}{SL_R}\int_{x_L}^{x_U}\int_{\phi_3}^{\phi_4} \frac{C_p\left(m^2 + \tan^2\theta_{XZ}\right)x^2\tan\theta_{XZ}\sin\phi}{\left(m^2\sin^2\phi + \cos^2\phi\right)^{3/2}}\, d\phi\, dx \qquad (39)$$

and

$$C_\ell = \frac{1}{SL_R}\int_{x'_L}^{x'_U}\int_{\phi_1}^{\phi_2} \frac{C_p'\left(m^2 - 1\right)\left(r^2 - x'^2\right)\sin\phi\cos\phi}{\left(m^2\sin^2\phi + \cos^2\phi\right)^2}\, d\phi\, dx'$$

$$+ \frac{1}{SL_R}\int_{x_L}^{x_U}\int_{\phi_3}^{\phi_4} \frac{C_p\left(m^2 - 1\right)x^2\tan^2\theta_{XZ}\sin\phi\cos\phi}{\left(m^2\sin^2\phi + \cos^2\phi\right)^2}\, d\phi\, dx \qquad (40)$$

where

$$x'_L = e - \frac{r}{\sin\theta_{XZ}\sec^2\theta_{XZ}} = r\sin\theta_{XZ};$$

$$x'_U = r; \qquad x_L = -L_R; \qquad x_U = x_t$$

and where

$$C_p = \frac{2}{m^2 s^2 \sin^2\phi + \cos^2\phi}\left(\lambda\sin\theta_{XZ}\sqrt{m^2\sin^2\phi + \cos^2\phi}\right.$$

$$\left. + ms\nu\cos\theta_{XY}\sin\phi - \omega\cos\theta_{XZ}\cos\phi\right)^2$$

$$s = \frac{\sin\theta_{XZ}}{\sin\theta_{XY}} \qquad \lambda = \cos\alpha\cos\beta \qquad m = \frac{\tan\theta_{XZ}}{\tan\theta_{XY}}$$

$$\omega = \sin\alpha\cos\beta \qquad \nu = -\sin\beta \qquad \ell = e$$

$$\phi_{3,4} = \cot^{-1}\left[\frac{-s^2\nu\,\omega\cos^2\theta_{XY} \mp \lambda m\sin\theta_{XZ}\sqrt{s^2\nu^2\cos^2\theta_{XY} - \left(\lambda^2\sin^2\theta_{XZ} - \omega^2\cos^2\theta_{XZ}\right)}}{\lambda^2\sin^2\theta_{XZ} - \omega^2\cos^2\theta_{XZ}}\right]$$

The maximum bluntness obtainable while maintaining tangency is defined by the following equation:

$$\left(\frac{r}{2a}\right)_{max} = \frac{1}{2 \cos \theta_{XZ}}$$

METHOD OF COMPUTATION

The aerodynamic coefficients presented were obtained by integrating the Newtonian force and moment equations with a numerical double integration routine on a digital computer. The reference length is defined as L_R, and the reference area is defined as the base area of the cone which is πab where

$$a = L_R \tan \theta_{XZ}; \quad b = L_R \tan \theta_{XY}$$

All coefficients correspond to a maximum stagnation point pressure coefficient C_p of 2.0. The aerodynamic coefficients of the cone base are not included. The directional stability derivatives were determined by computing the coefficients at an angle of sideslip of 1° and assuming linearity.

RESULTS AND DISCUSSION

The Newtonian longitudinal force and moment coefficients are presented in tables II through IX. The directional stability derivatives are presented in table X. Only those coefficients felt to be of importance for preliminary design purposes have been included.

The static longitudinal aerodynamics of an example configuration are illustrated in figure 4. As can be noted from tables II through IX, the trends shown in figure 4 exist for all configurations. For ξ less than or equal to 25, it is seen that blunting has a minor effect on all coefficients; however, as ξ increases above 25, the effects become more pronounced. The pitching-moment and normal-force coefficients decreased in magnitude with increasing bluntness as shown in figures 4(a) and 4(b). Figure 4(c) shows that at an

angle-of-attack of approximately 53°, C_A becomes independent of bluntness. Before this point, C_A increased with increasing bluntness, and after this point, C_A decreased with increasing bluntness. All configurations exhibited C_A being independent of bluntness at some angle-of-attack as may be noted from a study of the tabulated data. The expected trend of reduced L/D with increasing bluntness is shown in figure 4(d) for angles-of-attack lower than 90°. At angles-of-attack higher than 90° L/D has little meaning, since, in actual flight, the elliptical cone configuration would begin to exhibit base effects which are not included in this study.

CONCLUDING REMARKS

The derivation of equations to determine the Newtonian static longitudinal, directional, and lateral aerodynamics of blunted elliptical cones has been presented. Blunting of the cones was accomplished through the use of prolate spheroids which were forced to be tangent to the cones. These equations were used to predict the hypersonic aerodynamics of cones with a cross-sectional thickness ratio range of 0.25 to 3.00 and for the complete range of blunting. The static longitudinal aerodynamics for angles-of-attack from 0° to 180° and the directional stability derivatives at zero angle-of-attack were presented in tabular form.

It was found that, for all configurations, the effects of blunting are small when the bluntness is less than or equal to 25 percent of the maximum bluntness. Pitching moment and normal force were found to decrease in magnitude for increasing bluntness. Axial force increases with increasing bluntness for small angles-of-attack; however, it was found that at a certain angle-of-attack axial force becomes independent of bluntness. After this point, axial force decreases with increasing bluntness. Lift-to-drag ratio was found to decrease with increasing bluntness.

Manned Spacecraft Center
National Aeronautics and Space Administration
Houston, Texas, March 1, 1966

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TABLE I. - BLUNTNESS RATIOS, $\frac{r}{2a}$

θ_{XZ} \ ξ	25	50	75	100
20°	0.1330	0.2661	0.3991	0.5321
30°	.1444	.2887	.4331	.5774
40°	.1632	.3264	.4895	.6527
50°	.1945	.3890	.5834	.7779
60°	.2500	.5000	.7500	1.0000

TABLE II. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.25

(a) $\theta_{XZ} = 20°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.3223	-0.3205	-0.3081	-0.2742	-0.2085
20.0	-0.6057	-0.6024	-0.5790	-0.5154	-0.3918
30.0	-0.8353	-0.8305	-0.7969	-0.7058	-0.5287
40.0	-1.0227	-1.0163	-0.9712	-0.8487	-0.6105
50.0	-1.1562	-1.1481	-1.0910	-0.9360	-0.6345
60.0	-1.2233	-1.2137	-1.1466	-0.9642	-0.6096
70.0	-1.2175	-1.2070	-1.1334	-0.9333	-0.5443
80.0	-1.1404	-1.1296	-1.0543	-0.8495	-0.4514
90.0	-1.0017	-0.9914	-0.9197	-0.7250	-0.3464
100.0	-0.8181	-0.8091	-0.7462	-0.5753	-0.2429
110.0	-0.6118	-0.6046	-0.5544	-0.4179	-0.1525
120.0	-0.4072	-0.4021	-0.3665	-0.2698	-0.0818
130.0	-0.2282	-0.2252	-0.2040	-0.1463	-0.0343
140.0	-0.0947	-0.0934	-0.0842	-0.0591	-0.0103
150.0	-0.0192	-0.0189	-0.0169	-0.0114	-0.0009
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.4269	0.4117	0.3662	0.2903	0.1841
20.0	0.8023	0.7738	0.6882	0.5455	0.3460
30.0	1.1063	1.0664	0.9465	0.7465	0.4669
40.0	1.3546	1.3037	1.1508	0.8957	0.5392
50.0	1.5314	1.4708	1.2887	0.9850	0.5604
60.0	1.6203	1.5527	1.3498	1.0114	0.5384
70.0	1.6126	1.5419	1.3297	0.9756	0.4807
80.0	1.5105	1.4410	1.2325	0.8848	0.3987
90.0	1.3267	1.2629	1.0715	0.7522	0.3059
100.0	1.0836	1.0293	0.8663	0.5945	0.2145
110.0	0.8103	0.7681	0.6414	0.4301	0.1347
120.0	0.5394	0.5102	0.4226	0.2765	0.0722
130.0	0.3023	0.2853	0.2343	0.1492	0.0303
140.0	0.1255	0.1182	0.0964	0.0600	0.0091
150.0	0.0254	0.0239	0.0192	0.0115	0.0008
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.5638	0.6165	0.7745	1.0381	1.4065
10.0	0.5845	0.6342	0.7834	1.0324	1.3803
20.0	0.6439	0.6852	0.8092	1.0159	1.3050
30.0	0.7251	0.7541	0.8411	0.9862	1.1891
40.0	0.7957	0.8112	0.8576	0.9350	1.0433
50.0	0.8383	0.8410	0.8489	0.8621	0.8805
60.0	0.8433	0.8350	0.8099	0.7682	0.7099
70.0	0.8069	0.7906	0.7416	0.6599	0.5457
80.0	0.7315	0.7106	0.6479	0.5433	0.3972
90.0	0.6241	0.6019	0.5353	0.4243	0.2691
100.0	0.4961	0.4755	0.4139	0.3110	0.1673
110.0	0.3611	0.3445	0.2944	0.2109	0.0942
120.0	0.2338	0.2220	0.1867	0.1278	0.0454
130.0	0.1271	0.1201	0.0994	0.0649	0.0165
140.0	0.0509	0.0480	0.0393	0.0248	0.0045
150.0	0.0098	0.0093	0.0075	0.0045	0.0004
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.4908	0.4243	0.2689	0.0999	-0.0420
20.0	0.6068	0.5424	0.3715	0.1447	-0.0901
30.0	0.5043	0.4607	0.3322	0.1250	-0.1505
40.0	0.3555	0.3270	0.2365	0.0659	-0.2248
50.0	0.1999	0.1806	0.1162	-0.0208	-0.3158
60.0	0.0437	0.0302	-0.0169	-0.1267	-0.4209
70.0	-0.1154	-0.1254	-0.1611	-0.2507	-0.5457
80.0	-0.2837	-0.2914	-0.3197	-0.3950	-0.6975
90.0	-0.4704	-0.4766	-0.4996	-0.5641	-0.8798
100.0	-0.6898	-0.6949	-0.7142	-0.7706	-1.1084
110.0	-0.9664	-0.9709	-0.9880	-1.0399	-1.4259
120.0	-1.3482	-1.3523	-1.3681	-1.4178	-1.8932
130.0	-1.9458	-1.9492	-1.9624	-2.0053	-2.5536
140.0	-3.0919	-3.0959	-3.1106	-3.1630	-4.1141
150.0	-6.4454	-6.4558	-6.4856	-6.5705	-12.2845
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE II. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.25 - Continued

(b) $\theta_{XZ} = 30°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2952	-0.2937	-0.2832	-0.2549	-0.1997
20.0	-0.5548	-0.5520	-0.5323	-0.4790	-0.3753
30.0	-0.7474	-0.7437	-0.7172	-0.6454	-0.5056
40.0	-0.8628	-0.8583	-0.8269	-0.7418	-0.5760
50.0	-0.9150	-0.9098	-0.8738	-0.7759	-0.5855
60.0	-0.9072	-0.9015	-0.8616	-0.7534	-0.5427
70.0	-0.8443	-0.8383	-0.7967	-0.6836	-0.4634
80.0	-0.7357	-0.7298	-0.6890	-0.5782	-0.3625
90.0	-0.5953	-0.5900	-0.5531	-0.4528	-0.2576
100.0	-0.4405	-0.4361	-0.4057	-0.3233	-0.1628
110.0	-0.2895	-0.2864	-0.2643	-0.2045	-0.0882
120.0	-0.1598	-0.1579	-0.1444	-0.1080	-0.0371
130.0	-0.0650	-0.0642	-0.0582	-0.0420	-0.0105
140.0	-0.0128	-0.0126	-0.0113	-0.0078	-0.0010
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.3321	0.3207	0.2865	0.2295	0.1498
20.0	0.6241	0.6027	0.5384	0.4314	0.2815
30.0	0.8409	0.8120	0.7254	0.5812	0.3792
40.0	0.9706	0.9370	0.8359	0.6676	0.4320
50.0	1.0293	0.9925	0.8817	0.6973	0.4391
60.0	1.0206	0.9823	0.8672	0.6755	0.4071
70.0	0.9498	0.9122	0.7992	0.6110	0.3476
80.0	0.8276	0.7929	0.6886	0.5150	0.2719
90.0	0.6697	0.6400	0.5506	0.4016	0.1932
100.0	0.4955	0.4722	0.4021	0.2855	0.1221
110.0	0.3257	0.3095	0.2608	0.1797	0.0661
120.0	0.1797	0.1703	0.1418	0.0943	0.0278
130.0	0.0731	0.0691	0.0568	0.0364	0.0079
140.0	0.0144	0.0136	0.0110	0.0067	0.0008
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.9177	0.9555	1.0690	1.2581	1.5228
10.0	0.9193	0.9549	1.0620	1.2404	1.4901
20.0	0.9239	0.9534	1.0419	1.1894	1.3959
30.0	0.9310	0.9510	1.0112	1.1113	1.2516
40.0	0.9309	0.9399	0.9667	1.0114	1.0740
50.0	0.9026	0.9012	0.8971	0.8902	0.8805
60.0	0.8397	0.8301	0.8013	0.7534	0.6863
70.0	0.7437	0.7288	0.6839	0.6091	0.5044
80.0	0.6220	0.6048	0.5533	0.4674	0.3473
90.0	0.4855	0.4688	0.4188	0.3355	0.2189
100.0	0.3474	0.3334	0.2913	0.2213	0.1233
110.0	0.2210	0.2110	0.1808	0.1307	0.0604
120.0	0.1180	0.1120	0.0942	0.0644	0.0228
130.0	0.0463	0.0438	0.0361	0.0235	0.0057
140.0	0.0088	0.0082	0.0067	0.0041	0.0005
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1738	0.1506	0.0892	0.0084	-0.0745
20.0	0.2501	0.2180	0.1286	-0.0012	-0.1512
30.0	0.2142	0.1852	0.0990	-0.0418	-0.2335
40.0	0.1086	0.0859	0.0148	-0.1152	-0.3266
50.0	-0.0218	-0.0391	-0.0962	-0.2112	-0.4347
60.0	-0.1663	-0.1799	-0.2261	-0.3273	-0.5618
70.0	-0.3261	-0.3370	-0.3749	-0.4644	-0.7114
80.0	-0.5079	-0.5169	-0.5493	-0.6305	-0.8986
90.0	-0.7249	-0.7326	-0.7607	-0.8354	-1.1333
100.0	-1.0011	-1.0078	-1.0328	-1.1024	-1.4431
110.0	-1.3845	-1.3907	-1.4145	-1.4841	-1.9146
120.0	-1.9861	-1.9917	-2.0139	-2.0818	-2.6490
130.0	-3.1394	-3.1442	-3.1640	-3.2266	-3.9652
140.0	-6.5185	-6.5242	-6.5519	-6.7089	-10.1158
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE II. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.25 - Continued

(c) $\theta_{XZ} = 40°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2729	-0.2717	-0.2627	-0.2385	-0.1913
20.0	-0.5130	-0.5106	-0.4938	-0.4487	-0.3595
30.0	-0.6911	-0.6879	-0.6653	-0.6039	-0.4843
40.0	-0.7859	-0.7823	-0.7565	-0.6867	-0.5507
50.0	-0.7967	-0.7929	-0.7661	-0.6935	-0.5521
60.0	-0.7468	-0.7429	-0.7155	-0.6413	-0.4968
70.0	-0.6513	-0.6475	-0.6205	-0.5473	-0.4046
80.0	-0.5258	-0.5222	-0.4971	-0.4289	-0.2960
90.0	-0.3873	-0.3842	-0.3627	-0.3045	-0.1910
100.0	-0.2529	-0.2506	-0.2343	-0.1904	-0.1047
110.0	-0.1384	-0.1369	-0.1267	-0.0990	-0.0451
120.0	-0.0557	-0.0550	-0.0503	-0.0374	-0.0124
130.0	-0.0108	-0.0107	-0.0096	-0.0068	-0.0014
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.2403	0.2323	0.2082	0.1683	0.1122
20.0	0.4515	0.4365	0.3914	0.3162	0.2109
30.0	0.6084	0.5881	0.5273	0.4260	0.2842
40.0	0.6918	0.6688	0.5996	0.4845	0.3232
50.0	0.7013	0.6777	0.6070	0.4891	0.3240
60.0	0.6574	0.6345	0.5659	0.4516	0.2915
70.0	0.5733	0.5523	0.4893	0.3844	0.2374
80.0	0.4629	0.4448	0.3905	0.3002	0.1737
90.0	0.3409	0.3266	0.2837	0.2122	0.1121
100.0	0.2226	0.2125	0.1823	0.1320	0.0614
110.0	0.1218	0.1158	0.0980	0.0682	0.0265
120.0	0.0490	0.0464	0.0386	0.0255	0.0073
130.0	0.0095	0.0090	0.0073	0.0046	0.0008
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	1.2321	1.2579	1.3355	1.4646	1.6455
10.0	1.2161	1.2405	1.3135	1.4353	1.6058
20.0	1.1701	1.1902	1.2505	1.3508	1.4914
30.0	1.0997	1.1132	1.1538	1.2215	1.3167
40.0	1.0132	1.0187	1.0352	1.0627	1.1012
50.0	0.9129	0.9103	0.9026	0.8897	0.8717
60.0	0.7900	0.7812	0.7549	0.7112	0.6499
70.0	0.6484	0.6360	0.5990	0.5374	0.4511
80.0	0.4980	0.4849	0.4455	0.3799	0.2880
90.0	0.3512	0.3395	0.3044	0.2460	0.1641
100.0	0.2204	0.2116	0.1853	0.1414	0.0799
110.0	0.1160	0.1107	0.0948	0.0683	0.0311
120.0	0.0449	0.0426	0.0356	0.0239	0.0076
130.0	0.0084	0.0079	0.0065	0.0041	0.0008
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0205	0.0106	-0.0173	-0.0579	-0.1051
20.0	0.0192	0.0024	-0.0458	-0.1197	-0.2116
30.0	-0.0183	-0.0376	-0.0952	-0.1902	-0.3214
40.0	-0.0994	-0.1178	-0.1749	-0.2772	-0.4378
50.0	-0.2211	-0.2370	-0.2883	-0.3879	-0.5683
60.0	-0.3686	-0.3822	-0.4275	-0.5225	-0.7224
70.0	-0.5433	-0.5550	-0.5951	-0.6854	-0.9081
80.0	-0.7562	-0.7665	-0.8029	-0.8904	-1.1465
90.0	-1.0304	-1.0397	-1.0733	-1.1592	-1.4642
100.0	-1.4133	-1.4218	-1.4531	-1.5384	-1.9162
110.0	-2.0160	-2.0245	-2.0564	-2.1490	-2.6908
120.0	-3.1728	-3.1809	-3.2072	-3.2916	-4.0111
130.0	-6.5487	-6.5617	-6.6044	-6.8123	-9.9743
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE II. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.25 - Continued

(d) $\theta_{XZ} = 50°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2558	-0.2547	-0.2468	-0.2255	-0.1841
20.0	-0.4808	-0.4786	-0.4639	-0.4239	-0.3459
30.0	-0.6477	-0.6449	-0.6250	-0.5711	-0.4661
40.0	-0.7366	-0.7333	-0.7107	-0.6494	-0.5300
50.0	-0.7366	-0.7333	-0.7107	-0.6494	-0.5300
60.0	-0.6586	-0.6557	-0.6348	-0.5782	-0.4680
70.0	-0.5375	-0.5348	-0.5158	-0.4641	-0.3635
80.0	-0.3976	-0.3952	-0.3786	-0.3334	-0.2456
90.0	-0.2597	-0.2579	-0.2447	-0.2089	-0.1392
100.0	-0.1418	-0.1405	-0.1317	-0.1079	-0.0615
110.0	-0.0568	-0.0561	-0.0519	-0.0402	-0.0175
120.0	-0.0109	-0.0108	-0.0098	-0.0071	-0.0019
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1585	0.1534	0.1379	0.1121	0.0761
20.0	0.2979	0.2883	0.2592	0.2107	0.1429
30.0	0.4014	0.3884	0.3492	0.2839	0.1926
40.0	0.4565	0.4416	0.3971	0.3229	0.2190
50.0	0.4565	0.4416	0.3971	0.3229	0.2190
60.0	0.4082	0.3948	0.3545	0.2874	0.1934
70.0	0.3331	0.3217	0.2874	0.2302	0.1502
80.0	0.2464	0.2373	0.2102	0.1649	0.1015
90.0	0.1610	0.1545	0.1351	0.1028	0.0575
100.0	0.0879	0.0840	0.0723	0.0527	0.0254
110.0	0.0352	0.0334	0.0282	0.0195	0.0072
120.0	0.0068	0.0064	0.0053	0.0034	0.0008
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	1.4995	1.5158	1.5649	1.6468	1.7614
10.0	1.4682	1.4836	1.5299	1.6070	1.7149
20.0	1.3783	1.3910	1.4290	1.4925	1.5813
30.0	1.2405	1.2490	1.2745	1.3171	1.3766
40.0	1.0714	1.0748	1.0849	1.1018	1.1255
50.0	0.8915	0.8895	0.8832	0.8728	0.8583
60.0	0.7140	0.7073	0.6870	0.6533	0.6060
70.0	0.5386	0.5294	0.5018	0.4558	0.3915
80.0	0.3742	0.3649	0.3371	0.2906	0.2257
90.0	0.2318	0.2242	0.2016	0.1639	0.1112
100.0	0.1205	0.1157	0.1012	0.0770	0.0431
110.0	0.0461	0.0439	0.0373	0.0263	0.0109
120.0	0.0085	0.0080	0.0066	0.0043	0.0011
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.0671	-0.0716	-0.0848	-0.1053	-0.1310
20.0	-0.1370	-0.1457	-0.1713	-0.2119	-0.2649
30.0	-0.2138	-0.2259	-0.2619	-0.3217	-0.4048
40.0	-0.3043	-0.3184	-0.3619	-0.4383	-0.5540
50.0	-0.4221	-0.4368	-0.4832	-0.5704	-0.7182
60.0	-0.5830	-0.5969	-0.6422	-0.7334	-0.9100
70.0	-0.7887	-0.8016	-0.8451	-0.9392	-1.1508
80.0	-1.0588	-1.0709	-1.1128	-1.2103	-1.4706
90.0	-1.4397	-1.4517	-1.4923	-1.5951	-1.9331
100.0	-2.0421	-2.0533	-2.0934	-2.2033	-2.6704
110.0	-3.2000	-3.2115	-3.2525	-3.3785	-4.1549
120.0	-6.5849	-6.5928	-6.6648	-6.8666	-8.7378
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE II. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.25 - Concluded

(e) $\theta_{XZ} = 60°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2432	-0.2422	-0.2351	-0.2158	-0.1784
20.0	-0.4571	-0.4552	-0.4419	-0.4057	-0.3352
30.0	-0.6158	-0.6133	-0.5953	-0.5466	-0.4517
40.0	-0.7003	-0.6974	-0.6770	-0.6215	-0.5136
50.0	-0.7003	-0.6974	-0.6770	-0.6215	-0.5136
60.0	-0.6158	-0.6133	-0.5953	-0.5466	-0.4517
70.0	-0.4704	-0.4683	-0.4539	-0.4147	-0.3383
80.0	-0.3123	-0.3107	-0.2992	-0.2681	-0.2077
90.0	-0.1719	-0.1707	-0.1626	-0.1404	-0.0972
100.0	-0.0691	-0.0684	-0.0641	-0.0523	-0.0293
110.0	-0.0133	-0.0131	-0.0120	-0.0090	-0.0031
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0912	0.0883	0.0795	0.0650	0.0446
20.0	0.1714	0.1659	0.1495	0.1221	0.0838
30.0	0.2309	0.2236	0.2014	0.1645	0.1129
40.0	0.2626	0.2542	0.2291	0.1871	0.1284
50.0	0.2626	0.2542	0.2291	0.1871	0.1284
60.0	0.2309	0.2236	0.2014	0.1645	0.1129
70.0	0.1764	0.1707	0.1534	0.1247	0.0846
80.0	0.1171	0.1130	0.1008	0.0804	0.0519
90.0	0.0645	0.0619	0.0544	0.0419	0.0243
100.0	0.0259	0.0247	0.0213	0.0154	0.0073
110.0	0.0050	0.0047	0.0039	0.0026	0.0008
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	1.7143	1.7234	1.7509	1.7967	1.8607
10.0	1.6706	1.6793	1.7051	1.7482	1.8085
20.0	1.5449	1.5520	1.5733	1.6087	1.6583
30.0	1.3524	1.3571	1.3713	1.3950	1.4281
40.0	1.1162	1.1180	1.1236	1.1328	1.1458
50.0	0.8648	0.8636	0.8599	0.8538	0.8453
60.0	0.6286	0.6245	0.6122	0.5917	0.5630
70.0	0.4269	0.4209	0.4030	0.3731	0.3313
80.0	0.2600	0.2541	0.2364	0.2070	0.1657
90.0	0.1333	0.1291	0.1163	0.0950	0.0652
100.0	0.0503	0.0482	0.0420	0.0315	0.0168
110.0	0.0091	0.0087	0.0072	0.0049	0.0015
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.1206	-0.1226	-0.1286	-0.1383	-0.1510
20.0	-0.2432	-0.2474	-0.2599	-0.2803	-0.3078
30.0	-0.3701	-0.3768	-0.3968	-0.4301	-0.4765
40.0	-0.5043	-0.5137	-0.5424	-0.5919	-0.6645
50.0	-0.6521	-0.6643	-0.7024	-0.7712	-0.8804
60.0	-0.8339	-0.8481	-0.8937	-0.9813	-1.1366
70.0	-1.0931	-1.1078	-1.1566	-1.2577	-1.4645
80.0	-1.4687	-1.4835	-1.5343	-1.6488	-1.9298
90.0	-2.0684	-2.0835	-2.1371	-2.2689	-2.6820
100.0	-3.2253	-3.2412	-3.2976	-3.4569	-4.1542
110.0	-6.6075	-6.6403	-6.6475	-6.8307	-8.1295
120.0	0.	0.	0.	0.	—
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE III. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.50

(a) $\theta_{XZ} = 20°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2884	-0.2870	-0.2770	-0.2499	-0.1972
20.0	-0.5420	-0.5394	-0.5206	-0.4697	-0.3707
30.0	-0.7491	-0.7452	-0.7180	-0.6440	-0.5003
40.0	-0.9219	-0.9165	-0.8789	-0.7767	-0.5780
50.0	-1.0482	-1.0413	-0.9924	-0.8595	-0.6011
60.0	-1.1155	-1.1071	-1.0483	-0.8887	-0.5782
70.0	-1.1166	-1.1072	-1.0416	-0.8634	-0.5170
80.0	-1.0517	-1.0420	-0.9739	-0.7890	-0.4294
90.0	-0.9290	-0.9197	-0.8542	-0.6762	-0.3302
100.0	-0.7633	-0.7550	-0.6969	-0.5391	-0.2322
110.0	-0.5745	-0.5678	-0.5210	-0.3937	-0.1463
120.0	-0.3852	-0.3804	-0.3469	-0.2558	-0.0787
130.0	-0.2178	-0.2149	-0.1947	-0.1398	-0.0332
140.0	-0.0914	-0.0901	-0.0812	-0.0571	-0.0101
150.0	-0.0188	-0.0185	-0.0165	-0.0112	-0.0008
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.3820	0.3690	0.3301	0.2651	0.1742
20.0	0.7179	0.6935	0.6203	0.4982	0.3274
30.0	0.9922	0.9578	0.8546	0.6825	0.4419
40.0	1.2210	1.1766	1.0434	0.8211	0.5105
50.0	1.3884	1.3348	1.1740	0.9058	0.5309
60.0	1.4775	1.4171	1.2358	0.9334	0.5106
70.0	1.4789	1.4150	1.2234	0.9036	0.4566
80.0	1.3931	1.3297	1.1396	0.8225	0.3793
90.0	1.2305	1.1719	0.9958	0.7021	0.2916
100.0	1.0110	0.9607	0.8096	0.5575	0.2051
110.0	0.7610	0.7215	0.6030	0.4054	0.1292
120.0	0.5102	0.4827	0.4001	0.2622	0.0695
130.0	0.2885	0.2723	0.2237	0.1426	0.0293
140.0	0.1211	0.1140	0.0930	0.0579	0.0089
150.0	0.0249	0.0234	0.0189	0.0113	0.0007
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.4026	0.4595	0.6304	0.9155	1.3140
10.0	0.4241	0.4782	0.6405	0.9112	1.2897
20.0	0.4861	0.5320	0.6696	0.8990	1.2198
30.0	0.5715	0.6053	0.7068	0.8759	1.1124
40.0	0.6489	0.6694	0.7310	0.8336	0.9771
50.0	0.7018	0.7096	0.7329	0.7716	0.8259
60.0	0.7208	0.7175	0.7074	0.6905	0.6670
70.0	0.7018	0.6900	0.6547	0.5959	0.5137
80.0	0.6457	0.6288	0.5780	0.4933	0.3748
90.0	0.5585	0.5395	0.4825	0.3875	0.2547
100.0	0.4497	0.4315	0.3769	0.2860	0.1588
110.0	0.3316	0.3165	0.2712	0.1955	0.0898
120.0	0.2175	0.2066	0.1740	0.1196	0.0435
130.0	0.1199	0.1134	0.0939	0.0614	0.0159
140.0	0.0488	0.0460	0.0377	0.0238	0.0044
150.0	0.0096	0.0090	0.0073	0.0044	0.0003
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.6251	0.5241	0.3107	0.1090	-0.0403
20.0	0.7238	0.6373	0.4206	0.1582	-0.0871
30.0	0.5787	0.5252	0.3721	0.1392	-0.1465
40.0	0.4043	0.3711	0.2677	0.0799	-0.2201
50.0	0.2342	0.2126	0.1410	-0.0074	-0.3108
60.0	0.0698	0.0550	0.0037	-0.1138	-0.4155
70.0	-0.0943	-0.1050	-0.1433	-0.2383	-0.5399
80.0	-0.2655	-0.2737	-0.3037	-0.3829	-0.6915
90.0	-0.4538	-0.4604	-0.4846	-0.5519	-0.8733
100.0	-0.6739	-0.6793	-0.6994	-0.7578	-1.1008
110.0	-0.9505	-0.9551	-0.9728	-1.0264	-1.4176
120.0	-1.3313	-1.3355	-1.3518	-1.4029	-1.8843
130.0	-1.9270	-1.9305	-1.9439	-1.9875	-2.5389
140.0	-3.0691	-3.0738	-3.0891	-3.1416	-4.1042
150.0	-6.4237	-6.4303	-6.4492	-6.5495	-11.4690
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE III. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.50 - Continued

(b) $\theta_{XZ} = 30°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2745	-0.2732	-0.2641	-0.2396	-0.1919
20.0	-0.5158	-0.5134	-0.4964	-0.4504	-0.3606
30.0	-0.6950	-0.6917	-0.6688	-0.6068	-0.4859
40.0	-0.8030	-0.7991	-0.7718	-0.6977	-0.5536
50.0	-0.8538	-0.8492	-0.8174	-0.7310	-0.5629
60.0	-0.8495	-0.8444	-0.8086	-0.7114	-0.5222
70.0	-0.7939	-0.7885	-0.7504	-0.6473	-0.4464
80.0	-0.6949	-0.6895	-0.6517	-0.5492	-0.3497
90.0	-0.5651	-0.5602	-0.5256	-0.4317	-0.2490
100.0	-0.4204	-0.4163	-0.3876	-0.3096	-0.1578
110.0	-0.2780	-0.2750	-0.2540	-0.1969	-0.0857
120.0	-0.1545	-0.1527	-0.1398	-0.1046	-0.0363
130.0	-0.0634	-0.0626	-0.0568	-0.0410	-0.0103
140.0	-0.0126	-0.0124	-0.0112	-0.0077	-0.0010
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.3088	0.2985	0.2676	0.2160	0.1439
20.0	0.5803	0.5610	0.5028	0.4060	0.2705
30.0	0.7819	0.7558	0.6775	0.5470	0.3645
40.0	0.9033	0.8728	0.7813	0.6287	0.4152
50.0	0.9605	0.9268	0.8259	0.6577	0.4222
60.0	0.9557	0.9205	0.8147	0.6384	0.3917
70.0	0.8931	0.8583	0.7535	0.5790	0.3348
80.0	0.7818	0.7493	0.6519	0.4895	0.2623
90.0	0.6358	0.6077	0.5235	0.3832	0.1868
100.0	0.4730	0.4508	0.3843	0.2735	0.1184
110.0	0.3128	0.2973	0.2507	0.1730	0.0643
120.0	0.1739	0.1647	0.1372	0.0914	0.0272
130.0	0.0714	0.0674	0.0554	0.0356	0.0077
140.0	0.0142	0.0134	0.0109	0.0067	0.0008
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.7559	0.7989	0.9278	1.1426	1.4433
10.0	0.7604	0.8011	0.9234	1.1272	1.4124
20.0	0.7731	0.8075	0.9108	1.0828	1.3237
30.0	0.7927	0.8173	0.8914	1.0149	1.1877
40.0	0.8080	0.8213	0.8611	0.9274	1.0203
50.0	0.7971	0.7997	0.8073	0.8199	0.8377
60.0	0.7528	0.7466	0.7281	0.6973	0.6542
70.0	0.6757	0.6636	0.6272	0.5666	0.4819
80.0	0.5719	0.5569	0.5121	0.4373	0.3327
90.0	0.4514	0.4364	0.3911	0.3158	0.2104
100.0	0.3265	0.3135	0.2746	0.2097	0.1189
110.0	0.2100	0.2005	0.1721	0.1248	0.0586
120.0	0.1133	0.1076	0.0905	0.0621	0.0222
130.0	0.0450	0.0425	0.0351	0.0228	0.0056
140.0	0.0086	0.0081	0.0066	0.0041	0.0005
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.2144	0.1842	0.1079	0.0148	-0.0731
20.0	0.3037	0.2640	0.1566	0.0097	-0.1486
30.0	0.2606	0.2265	0.1269	-0.0292	-0.2298
40.0	0.1439	0.1182	0.0387	-0.1027	-0.3221
50.0	0.0054	-0.0137	-0.0760	-0.1992	-0.4297
60.0	-0.1446	-0.1592	-0.2087	-0.3158	-0.5564
70.0	-0.3078	-0.3193	-0.3595	-0.4532	-0.7056
80.0	-0.4918	-0.5012	-0.5351	-0.6195	-0.8925
90.0	-0.7100	-0.7180	-0.7472	-0.8243	-1.1266
100.0	-0.9868	-0.9937	-1.0193	-1.0908	-1.4356
110.0	-1.3699	-1.3764	-1.4007	-1.4716	-1.9064
120.0	-1.9708	-1.9768	-1.9990	-2.0679	-2.6389
130.0	-3.1235	-3.1274	-3.1468	-3.2094	-3.9527
140.0	-6.5131	-6.4990	-6.5263	-6.6849	-10.7698
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE III. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0. 50 - Continued

(c) $\theta_{XZ} = 40°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2608	-0.2597	-0.2515	-0.2294	-0.1862
20.0	-0.4902	-0.4880	-0.4727	-0.4311	-0.3500
30.0	-0.6605	-0.6575	-0.6369	-0.5808	-0.4716
40.0	-0.7511	-0.7477	-0.7242	-0.6605	-0.5363
50.0	-0.7618	-0.7583	-0.7337	-0.6672	-0.5376
60.0	-0.7152	-0.7116	-0.6863	-0.6176	-0.4839
70.0	-0.6253	-0.6217	-0.5964	-0.5279	-0.3944
80.0	-0.5064	-0.5030	-0.4792	-0.4147	-0.2889
90.0	-0.3744	-0.3715	-0.3509	-0.2952	-0.1867
100.0	-0.2456	-0.2433	-0.2277	-0.1853	-0.1026
110.0	-0.1351	-0.1337	-0.1237	-0.0968	-0.0444
120.0	-0.0547	-0.0540	-0.0494	-0.0368	-0.0123
130.0	-0.0107	-0.0105	-0.0095	-0.0068	-0.0014
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.2296	0.2221	0.1995	0.1619	0.1093
20.0	0.4315	0.4174	0.3750	0.3043	0.2054
30.0	0.5814	0.5623	0.5052	0.4100	0.2767
40.0	0.6611	0.6395	0.5745	0.4663	0.3147
50.0	0.6705	0.6483	0.5817	0.4708	0.3155
60.0	0.6295	0.6079	0.5431	0.4352	0.2839
70.0	0.5504	0.5305	0.4707	0.3710	0.2314
80.0	0.4458	0.4285	0.3767	0.2904	0.1695
90.0	0.3296	0.3158	0.2745	0.2058	0.1096
100.0	0.2162	0.2064	0.1772	0.1285	0.0602
110.0	0.1189	0.1131	0.0957	0.0667	0.0260
120.0	0.0481	0.0456	0.0379	0.0251	0.0072
130.0	0.0094	0.0089	0.0073	0.0046	0.0008
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	1.1044	1.1344	1.2244	1.3744	1.5844
10.0	1.0913	1.1198	1.2051	1.3472	1.5463
20.0	1.0537	1.0776	1.1494	1.2690	1.4365
30.0	0.9961	1.0131	1.0642	1.1492	1.2682
40.0	0.9254	0.9340	0.9595	1.0021	1.0618
50.0	0.8420	0.8419	0.8418	0.8416	0.8414
60.0	0.7356	0.7289	0.7087	0.6752	0.6283
70.0	0.6092	0.5984	0.5661	0.5123	0.4369
80.0	0.4720	0.4600	0.4239	0.3638	0.2796
90.0	0.3357	0.3247	0.2917	0.2367	0.1598
100.0	0.2124	0.2040	0.1788	0.1368	0.0781
110.0	0.1128	0.1076	0.0922	0.0665	0.0306
120.0	0.0440	0.0417	0.0349	0.0235	0.0075
130.0	0.0083	0.0078	0.0064	0.0040	0.0008
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0329	0.0213	-0.0105	-0.0550	-0.1043
20.0	0.0396	0.0205	-0.0337	-0.1142	-0.2100
30.0	0.0047	-0.0169	-0.0805	-0.1829	-0.3190
40.0	-0.0780	-0.0981	-0.1600	-0.2689	-0.4346
50.0	-0.2028	-0.2199	-0.2746	-0.3794	-0.5645
60.0	-0.3530	-0.3673	-0.4150	-0.5139	-0.7181
70.0	-0.5295	-0.5417	-0.5835	-0.6768	-0.9033
80.0	-0.7437	-0.7543	-0.7919	-0.8817	-1.1413
90.0	-1.0185	-1.0281	-1.0624	-1.1502	-1.4584
100.0	-1.4017	-1.4103	-1.4422	-1.5287	-1.9095
110.0	-2.0043	-2.0128	-2.0450	-2.1382	-2.6838
120.0	-3.1601	-3.1669	-3.1942	-3.2796	-4.0037
130.0	-6.5202	-6.5594	-6.6103	-6.7296	-9.3654
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE III. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0. 50 - Continued

(d) $\theta_{XZ} = 50°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2491	-0.2480	-0.2406	-0.2204	-0.1811
20.0	-0.4681	-0.4661	-0.4522	-0.4142	-0.3403
30.0	-0.6307	-0.6280	-0.6092	-0.5581	-0.4585
40.0	-0.7172	-0.7142	-0.6928	-0.6346	-0.5214
50.0	-0.7172	-0.7142	-0.6928	-0.6346	-0.5214
60.0	-0.6416	-0.6388	-0.6189	-0.5651	-0.4604
70.0	-0.5242	-0.5216	-0.5034	-0.4539	-0.3577
80.0	-0.3885	-0.3862	-0.3702	-0.3266	-0.2419
90.0	-0.2545	-0.2527	-0.2398	-0.2050	-0.1373
100.0	-0.1394	-0.1382	-0.1296	-0.1062	-0.0608
110.0	-0.0561	-0.0555	-0.0512	-0.0397	-0.0174
120.0	-0.0108	-0.0107	-0.0097	-0.0071	-0.0019
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1544	0.1494	0.1345	0.1096	0.0748
20.0	0.2901	0.2808	0.2528	0.2060	0.1406
30.0	0.3909	0.3783	0.3405	0.2776	0.1895
40.0	0.4445	0.4302	0.3872	0.3156	0.2154
50.0	0.4445	0.4302	0.3872	0.3156	0.2154
60.0	0.3976	0.3847	0.3458	0.2810	0.1903
70.0	0.3249	0.3138	0.2806	0.2253	0.1478
80.0	0.2408	0.2320	0.2056	0.1615	0.0999
90.0	0.1577	0.1514	0.1325	0.1009	0.0567
100.0	0.0864	0.0826	0.0711	0.0519	0.0251
110.0	0.0347	0.0330	0.0278	0.0192	0.0072
120.0	0.0067	0.0064	0.0052	0.0034	0.0008
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	1.4128	1.4320	1.4895	1.5854	1.7196
10.0	1.3838	1.4020	1.4564	1.5472	1.6743
20.0	1.3003	1.3156	1.3612	1.4374	1.5440
30.0	1.1724	1.1832	1.2154	1.2692	1.3444
40.0	1.0156	1.0208	1.0365	1.0628	1.0995
50.0	0.8486	0.8480	0.8462	0.8431	0.8389
60.0	0.6833	0.6777	0.6607	0.6324	0.5929
70.0	0.5184	0.5100	0.4847	0.4425	0.3835
80.0	0.3623	0.3535	0.3271	0.2831	0.2215
90.0	0.2257	0.2184	0.1966	0.1603	0.1094
100.0	0.1181	0.1134	0.0992	0.0756	0.0425
110.0	0.0454	0.0433	0.0368	0.0260	0.0108
120.0	0.0084	0.0079	0.0066	0.0043	0.0011
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.0635	-0.0685	-0.0826	-0.1042	-0.1306
20.0	-0.1303	-0.1397	-0.1670	-0.2097	-0.2641
30.0	-0.2046	-0.2175	-0.2558	-0.3184	-0.4036
40.0	-0.2936	-0.3086	-0.3544	-0.4340	-0.5523
50.0	-0.4112	-0.4266	-0.4750	-0.5652	-0.7158
60.0	-0.5728	-0.5872	-0.6340	-0.7278	-0.9070
70.0	-0.7791	-0.7924	-0.8370	-0.9332	-1.1473
80.0	-1.0498	-1.0621	-1.1048	-1.2039	-1.4666
90.0	-1.4309	-1.4425	-1.4841	-1.5883	-1.9286
100.0	-2.0331	-2.0440	-2.0850	-2.1954	-2.6667
110.0	-3.1912	-3.2012	-3.2454	-3.3688	-4.1515
120.0	-6.5594	-6.5658	-6.6656	-6.7874	-8.7378
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE III. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.50 - Concluded

(e) $\theta_{XZ} = 60°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2398	-0.2388	-0.2320	-0.2132	-0.1770
20.0	-0.4507	-0.4489	-0.4359	-0.4007	-0.3326
30.0	-0.6073	-0.6048	-0.5873	-0.5399	-0.4481
40.0	-0.6906	-0.6877	-0.6679	-0.6140	-0.5095
50.0	-0.6906	-0.6877	-0.6679	-0.6140	-0.5095
60.0	-0.6073	-0.6048	-0.5873	-0.5399	-0.4481
70.0	-0.4640	-0.4620	-0.4479	-0.4097	-0.3357
80.0	-0.3083	-0.3067	-0.2955	-0.2651	-0.2062
90.0	-0.1700	-0.1689	-0.1608	-0.1390	-0.0967
100.0	-0.0685	-0.0679	-0.0636	-0.0519	-0.0292
110.0	-0.0132	-0.0131	-0.0120	-0.0090	-0.0031
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0899	0.0871	0.0785	0.0642	0.0443
20.0	0.1690	0.1637	0.1475	0.1207	0.0832
30.0	0.2277	0.2205	0.1988	0.1626	0.1121
40.0	0.2590	0.2507	0.2260	0.1849	0.1275
50.0	0.2590	0.2507	0.2260	0.1849	0.1275
60.0	0.2277	0.2205	0.1988	0.1626	0.1121
70.0	0.1740	0.1684	0.1514	0.1233	0.0840
80.0	0.1156	0.1116	0.0996	0.0795	0.0516
90.0	0.0638	0.0613	0.0538	0.0415	0.0242
100.0	0.0257	0.0245	0.0211	0.0153	0.0073
110.0	0.0050	0.0047	0.0039	0.0026	0.0008
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	1.6641	1.6749	1.7071	1.7609	1.8359
10.0	1.6218	1.6320	1.6626	1.7135	1.7844
20.0	1.5002	1.5087	1.5343	1.5769	1.6363
30.0	1.3138	1.3198	1.3377	1.3676	1.4093
40.0	1.0852	1.0880	1.0966	1.1109	1.1308
50.0	0.8419	0.8414	0.8400	0.8377	0.8345
60.0	0.6132	0.6097	0.5989	0.5810	0.5561
70.0	0.4178	0.4121	0.3952	0.3669	0.3275
80.0	0.2554	0.2496	0.2325	0.2039	0.1642
90.0	0.1315	0.1273	0.1148	0.0939	0.0647
100.0	0.0499	0.0478	0.0416	0.0312	0.0168
110.0	0.0091	0.0086	0.0072	0.0048	0.0015
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.1197	-0.1218	-0.1280	-0.1379	-0.1509
20.0	-0.2414	-0.2458	-0.2588	-0.2797	-0.3074
30.0	-0.3673	-0.3742	-0.3949	-0.4290	-0.4759
40.0	-0.5003	-0.5100	-0.5396	-0.5903	-0.6636
50.0	-0.6470	-0.6595	-0.6986	-0.7688	-0.8789
60.0	-0.8281	-0.8426	-0.8891	-0.9782	-1.1343
70.0	-1.0871	-1.1020	-1.1516	-1.2540	-1.4613
80.0	-1.4626	-1.4776	-1.5289	-1.6443	-1.9251
90.0	-2.0621	-2.0773	-2.1311	-2.2639	-2.6763
100.0	-3.2187	-3.2334	-3.2913	-3.4511	-4.1526
110.0	-6.6178	-6.6331	-6.6653	-6.8247	-8.3099
120.0	0.	0.	0.	0.	—
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE IV. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.75

(a) $\theta_{XZ} = 20°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2557	-0.2546	-0.2467	-0.2255	-0.1840
20.0	-0.4806	-0.4785	-0.4637	-0.4237	-0.3459
30.0	-0.6657	-0.6626	-0.6408	-0.5817	-0.4669
40.0	-0.8232	-0.8188	-0.7878	-0.7035	-0.5397
50.0	-0.9410	-0.9351	-0.8936	-0.7808	-0.5616
60.0	-1.0064	-0.9991	-0.9482	-0.8098	-0.5408
70.0	-1.0122	-1.0039	-0.9462	-0.7893	-0.4842
80.0	-0.9579	-0.9492	-0.8885	-0.7236	-0.4029
90.0	-0.8502	-0.8418	-0.7828	-0.6223	-0.3104
100.0	-0.7022	-0.6946	-0.6418	-0.4981	-0.2188
110.0	-0.5316	-0.5255	-0.4824	-0.3656	-0.1383
120.0	-0.3589	-0.3545	-0.3234	-0.2389	-0.0748
130.0	-0.2047	-0.2020	-0.1831	-0.1316	-0.0316
140.0	-0.0869	-0.0857	-0.0773	-0.0543	-0.0097
150.0	-0.0182	-0.0179	-0.0160	-0.0109	-0.0008
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.3387	0.3277	0.2947	0.2396	0.1625
20.0	0.6365	0.6158	0.5538	0.4502	0.3055
30.0	0.8817	0.8524	0.7644	0.6176	0.4123
40.0	1.0904	1.0520	0.9370	0.7450	0.4766
50.0	1.2464	1.1995	1.0588	0.8241	0.4960
60.0	1.3330	1.2795	1.1192	0.8516	0.4776
70.0	1.3407	1.2836	1.1124	0.8268	0.4277
80.0	1.2688	1.2117	1.0405	0.7550	0.3558
90.0	1.1262	1.0729	0.9132	0.6467	0.2741
100.0	0.9301	0.8840	0.7459	0.5154	0.1933
110.0	0.7041	0.6677	0.5586	0.3766	0.1222
120.0	0.4754	0.4498	0.3730	0.2450	0.0660
130.0	0.2711	0.2559	0.2103	0.1343	0.0279
140.0	0.1152	0.1085	0.0885	0.0552	0.0086
150.0	0.0241	0.0227	0.0183	0.0110	0.0007
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.2986	0.3557	0.5270	0.8128	1.2122
10.0	0.3195	0.3739	0.5371	0.8094	1.1900
20.0	0.3796	0.4262	0.5662	0.7997	1.1260
30.0	0.4622	0.4976	0.6036	0.7804	1.0277
40.0	0.5383	0.5612	0.6296	0.7439	0.9035
50.0	0.5932	0.6039	0.6361	0.6897	0.7647
60.0	0.6182	0.6182	0.6182	0.6183	0.6184
70.0	0.6093	0.6010	0.5762	0.5349	0.4771
80.0	0.5667	0.5531	0.5123	0.4441	0.3489
90.0	0.4951	0.4790	0.4308	0.3502	0.2376
100.0	0.4027	0.3868	0.3392	0.2597	0.1486
110.0	0.3001	0.2866	0.2462	0.1787	0.0844
120.0	0.1992	0.1893	0.1596	0.1102	0.0411
130.0	0.1113	0.1053	0.0873	0.0572	0.0151
140.0	0.0461	0.0435	0.0356	0.0225	0.0042
150.0	0.0093	0.0087	0.0071	0.0043	0.0003
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.7446	0.6064	0.3394	0.1137	-0.0388
20.0	0.8154	0.7084	0.4529	0.1652	-0.0843
30.0	0.6330	0.5710	0.3980	0.1468	-0.1430
40.0	0.4395	0.4025	0.2886	0.0882	-0.2160
50.0	0.2595	0.2359	0.1585	0.0013	-0.3063
60.0	0.0896	0.0736	0.0189	-0.1048	-0.4105
70.0	-0.0776	-0.0891	-0.1296	-0.2290	-0.5345
80.0	-0.2506	-0.2593	-0.2907	-0.3732	-0.6857
90.0	-0.4397	-0.4465	-0.4717	-0.5416	-0.8668
100.0	-0.6597	-0.6652	-0.6861	-0.7465	-1.0931
110.0	-0.9353	-0.9401	-0.9584	-1.0135	-1.4089
120.0	-1.3142	-1.3185	-1.3352	-1.3877	-1.8750
130.0	-1.9063	-1.9098	-1.9235	-1.9677	-2.5232
140.0	-3.0427	-3.0463	-3.0620	-3.1149	-4.0763
150.0	-6.3902	-6.3959	-6.4263	-6.4899	-12.1968
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE IV. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.75 - Continued

(b) $\theta_{XZ} = 30°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2506	-0.2495	-0.2420	-0.2216	-0.1818
20.0	-0.4710	-0.4690	-0.4548	-0.4164	-0.3416
30.0	-0.6346	-0.6318	-0.6128	-0.5610	-0.4602
40.0	-0.7340	-0.7307	-0.7077	-0.6455	-0.5244
50.0	-0.7828	-0.7789	-0.7516	-0.6775	-0.5334
60.0	-0.7820	-0.7775	-0.7461	-0.6610	-0.4953
70.0	-0.7340	-0.7292	-0.6952	-0.6032	-0.4240
80.0	-0.6456	-0.6407	-0.6065	-0.5136	-0.3328
90.0	-0.5278	-0.5233	-0.4915	-0.4053	-0.2375
100.0	-0.3950	-0.3912	-0.3645	-0.2920	-0.1510
110.0	-0.2630	-0.2602	-0.2404	-0.1868	-0.0824
120.0	-0.1474	-0.1457	-0.1334	-0.1000	-0.0350
130.0	-0.0612	-0.0604	-0.0548	-0.0396	-0.0100
140.0	-0.0124	-0.0122	-0.0109	-0.0076	-0.0010
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.2819	0.2728	0.2455	0.2000	0.1363
20.0	0.5299	0.5128	0.4614	0.3759	0.2562
30.0	0.7139	0.6908	0.6217	0.5065	0.3452
40.0	0.8257	0.7987	0.7176	0.5825	0.3933
50.0	0.8806	0.8506	0.7604	0.6103	0.4001
60.0	0.8797	0.8480	0.7526	0.5938	0.3715
70.0	0.8258	0.7940	0.6988	0.5401	0.3180
80.0	0.7263	0.6965	0.6071	0.4581	0.2496
90.0	0.5938	0.5678	0.4898	0.3599	0.1781
100.0	0.4443	0.4237	0.3615	0.2581	0.1132
110.0	0.2959	0.2813	0.2373	0.1642	0.0618
120.0	0.1658	0.1571	0.1309	0.0873	0.0263
130.0	0.0688	0.0650	0.0535	0.0343	0.0075
140.0	0.0139	0.0131	0.0106	0.0065	0.0008
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.6100	0.6560	0.7942	1.0243	1.3465
10.0	0.6165	0.6603	0.7919	1.0111	1.3179
20.0	0.6351	0.6726	0.7853	0.9729	1.2356
30.0	0.6636	0.6914	0.7751	0.9145	1.1095
40.0	0.6901	0.7066	0.7562	0.8388	0.9543
50.0	0.6926	0.6983	0.7156	0.7445	0.7848
60.0	0.6636	0.6605	0.6512	0.6358	0.6142
70.0	0.6032	0.5938	0.5657	0.5189	0.4535
80.0	0.5164	0.5038	0.4658	0.4026	0.3141
90.0	0.4122	0.3989	0.3589	0.2924	0.1993
100.0	0.3014	0.2896	0.2543	0.1955	0.1131
110.0	0.1961	0.1873	0.1611	0.1173	0.0560
120.0	0.1072	0.1018	0.0857	0.0589	0.0214
130.0	0.0432	0.0408	0.0337	0.0219	0.0054
140.0	0.0084	0.0079	0.0064	0.0040	0.0005
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.2600	0.2208	0.1268	0.0208	-0.0716
20.0	0.3608	0.3119	0.1842	0.0197	-0.1456
30.0	0.3075	0.2675	0.1536	-0.0178	-0.2257
40.0	0.1783	0.1494	0.0611	-0.0914	-0.3172
50.0	0.0317	0.0107	-0.0570	-0.1882	-0.4242
60.0	-0.1233	-0.1390	-0.1920	-0.3049	-0.5505
70.0	-0.2895	-0.3017	-0.3442	-0.4422	-0.6991
80.0	-0.4752	-0.4851	-0.5206	-0.6082	-0.8856
90.0	-0.6941	-0.7025	-0.7328	-0.8124	-1.1188
100.0	-0.9708	-0.9779	-1.0043	-1.0777	-1.4264
110.0	-1.3530	-1.3596	-1.3845	-1.4572	-1.8964
120.0	-1.9519	-1.9578	-1.9806	-2.0509	-2.6261
130.0	-3.1000	-3.1052	-3.1250	-3.1861	-3.9363
140.0	-6.4727	-6.4654	-6.5139	-6.6634	-10.4621
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE IV. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.75 - Continued

(c) $\theta_{XZ} = 40°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2449	-0.2439	-0.2367	-0.2172	-0.1791
20.0	-0.4603	-0.4583	-0.4448	-0.4081	-0.3367
30.0	-0.6201	-0.6175	-0.5993	-0.5499	-0.4536
40.0	-0.7051	-0.7022	-0.6815	-0.6253	-0.5158
50.0	-0.7157	-0.7126	-0.6909	-0.6319	-0.5172
60.0	-0.6733	-0.6701	-0.6474	-0.5857	-0.4656
70.0	-0.5906	-0.5873	-0.5643	-0.5017	-0.3799
80.0	-0.4802	-0.4771	-0.4550	-0.3952	-0.2787
90.0	-0.3567	-0.3540	-0.3347	-0.2824	-0.1805
100.0	-0.2353	-0.2332	-0.2184	-0.1781	-0.0995
110.0	-0.1303	-0.1290	-0.1195	-0.0936	-0.0432
120.0	-0.0532	-0.0526	-0.0481	-0.0359	-0.0120
130.0	-0.0105	-0.0104	-0.0094	-0.0067	-0.0013
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.2156	0.2087	0.1879	0.1534	0.1051
20.0	0.4051	0.3922	0.3532	0.2884	0.1976
30.0	0.5458	0.5283	0.4759	0.3885	0.2662
40.0	0.6207	0.6008	0.5412	0.4418	0.3027
50.0	0.6300	0.6096	0.5483	0.4463	0.3035
60.0	0.5927	0.5727	0.5128	0.4130	0.2732
70.0	0.5199	0.5013	0.4456	0.3529	0.2229
80.0	0.4227	0.4065	0.3579	0.2769	0.1635
90.0	0.3140	0.3010	0.2620	0.1970	0.1059
100.0	0.2072	0.1979	0.1700	0.1235	0.0584
110.0	0.1147	0.1091	0.0924	0.0645	0.0254
120.0	0.0469	0.0444	0.0369	0.0245	0.0071
130.0	0.0093	0.0087	0.0071	0.0045	0.0008
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.9585	0.9925	1.0945	1.2643	1.5027
10.0	0.9486	0.9810	1.0781	1.2397	1.4662
20.0	0.9201	0.9478	1.0307	1.1689	1.3625
30.0	0.8765	0.8969	0.9582	1.0604	1.2035
40.0	0.8229	0.8345	0.8693	0.9273	1.0085
50.0	0.7578	0.7604	0.7684	0.7817	0.8003
60.0	0.6696	0.6652	0.6519	0.6298	0.5988
70.0	0.5606	0.5516	0.5248	0.4801	0.4174
80.0	0.4387	0.4281	0.3960	0.3427	0.2680
90.0	0.3151	0.3050	0.2748	0.2243	0.1537
100.0	0.2014	0.1935	0.1699	0.1306	0.0754
110.0	0.1081	0.1032	0.0885	0.0640	0.0297
120.0	0.0427	0.0405	0.0338	0.0228	0.0073
130.0	0.0081	0.0077	0.0063	0.0040	0.0008
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0490	0.0351	-0.0019	-0.0514	-0.1033
20.0	0.0658	0.0433	-0.0189	-0.1076	-0.2080
30.0	0.0334	0.0088	-0.0627	-0.1741	-0.3159
40.0	-0.0519	-0.0743	-0.1423	-0.2591	-0.4305
50.0	-0.1810	-0.1995	-0.2584	-0.3694	-0.5596
60.0	-0.3344	-0.3496	-0.4002	-0.5039	-0.7125
70.0	-0.5130	-0.5258	-0.5695	-0.6665	-0.8970
80.0	-0.7283	-0.7394	-0.7783	-0.8710	-1.1345
90.0	-1.0036	-1.0134	-1.0488	-1.1388	-1.4506
100.0	-1.3864	-1.3952	-1.4278	-1.5161	-1.9002
110.0	-1.9879	-1.9965	-2.0294	-2.1242	-2.6738
120.0	-3.1424	-3.1490	-3.1762	-3.2612	-3.9981
130.0	-6.5247	-6.5399	-6.5647	-6.7413	-9.3436
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE IV. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.75 - Continued

(d) $\theta_{XZ} = 50°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2394	-0.2384	-0.2315	-0.2129	-0.1766
20.0	-0.4499	-0.4480	-0.4351	-0.4001	-0.3318
30.0	-0.6061	-0.6036	-0.5862	-0.5390	-0.4471
40.0	-0.6892	-0.6864	-0.6666	-0.6129	-0.5084
50.0	-0.6892	-0.6864	-0.6666	-0.6129	-0.5084
60.0	-0.6168	-0.6142	-0.5959	-0.5460	-0.4490
70.0	-0.5048	-0.5024	-0.4854	-0.4391	-0.3490
80.0	-0.3752	-0.3730	-0.3578	-0.3166	-0.2362
90.0	-0.2467	-0.2450	-0.2327	-0.1993	-0.1343
100.0	-0.1358	-0.1346	-0.1263	-0.1037	-0.0597
110.0	-0.0550	-0.0544	-0.0502	-0.0390	-0.0171
120.0	-0.0107	-0.0106	-0.0096	-0.0070	-0.0019
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1483	0.1436	0.1295	0.1059	0.0730
20.0	0.2788	0.2699	0.2434	0.1991	0.1371
30.0	0.3756	0.3637	0.3279	0.2682	0.1847
40.0	0.4272	0.4136	0.3729	0.3050	0.2101
50.0	0.4272	0.4136	0.3729	0.3050	0.2101
60.0	0.3823	0.3700	0.3331	0.2716	0.1855
70.0	0.3129	0.3023	0.2707	0.2180	0.1442
80.0	0.2325	0.2241	0.1988	0.1566	0.0976
90.0	0.1529	0.1468	0.1286	0.0981	0.0555
100.0	0.0842	0.0805	0.0693	0.0507	0.0247
110.0	0.0341	0.0324	0.0273	0.0189	0.0071
120.0	0.0066	0.0063	0.0052	0.0033	0.0008
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	1.2967	1.3193	1.3872	1.5003	1.6586
10.0	1.2707	1.2922	1.3568	1.4644	1.6150
20.0	1.1958	1.2141	1.2692	1.3610	1.4895
30.0	1.0810	1.0945	1.1350	1.2027	1.2973
40.0	0.9402	0.9477	0.9705	1.0084	1.0614
50.0	0.7903	0.7916	0.7953	0.8017	0.8105
60.0	0.6412	0.6370	0.6243	0.6031	0.5736
70.0	0.4903	0.4828	0.4606	0.4236	0.3717
80.0	0.3453	0.3372	0.3128	0.2721	0.2152
90.0	0.2169	0.2100	0.1893	0.1549	0.1067
100.0	0.1144	0.1099	0.0962	0.0735	0.0417
110.0	0.0444	0.0423	0.0360	0.0254	0.0107
120.0	0.0083	0.0079	0.0065	0.0042	0.0011
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.0584	-0.0639	-0.0795	-0.1027	-0.1301
20.0	-0.1206	-0.1310	-0.1610	-0.2067	-0.2631
30.0	-0.1914	-0.2056	-0.2472	-0.3139	-0.4019
40.0	-0.2785	-0.2948	-0.3440	-0.4280	-0.5499
50.0	-0.3961	-0.4124	-0.4638	-0.5582	-0.7125
60.0	-0.5588	-0.5738	-0.6228	-0.7201	-0.9028
70.0	-0.7661	-0.7798	-0.8260	-0.9250	-1.1422
80.0	-1.0372	-1.0498	-1.0937	-1.1950	-1.4607
90.0	-1.4183	-1.4302	-1.4725	-1.5785	-1.9218
100.0	-2.0200	-2.0313	-2.0729	-2.1840	-2.6573
110.0	-3.1763	-3.1883	-3.2301	-3.3586	-4.1364
120.0	-6.5594	-6.5590	-6.6075	-6.8447	-8.8606
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE IV. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=0.75 - Concluded

(e) $\Theta_{XZ} = 60°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2346	-0.2337	-0.2271	-0.2091	-0.1743
20.0	-0.4409	-0.4392	-0.4267	-0.3931	-0.3275
30.0	-0.5941	-0.5917	-0.5750	-0.5296	-0.4413
40.0	-0.6755	-0.6728	-0.6538	-0.6022	-0.5018
50.0	-0.6755	-0.6728	-0.6538	-0.6022	-0.5018
60.0	-0.5941	-0.5917	-0.5750	-0.5296	-0.4413
70.0	-0.4541	-0.4521	-0.4386	-0.4020	-0.3306
80.0	-0.3022	-0.3007	-0.2898	-0.2604	-0.2031
90.0	-0.1671	-0.1660	-0.1581	-0.1368	-0.0953
100.0	-0.0676	-0.0670	-0.0627	-0.0512	-0.0288
110.0	-0.0131	-0.0130	-0.0119	-0.0089	-0.0031
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0880	0.0852	0.0769	0.0630	0.0436
20.0	0.1653	0.1601	0.1445	0.1184	0.0819
30.0	0.2228	0.2157	0.1947	0.1595	0.1103
40.0	0.2533	0.2453	0.2214	0.1814	0.1255
50.0	0.2533	0.2453	0.2214	0.1814	0.1255
60.0	0.2228	0.2157	0.1947	0.1595	0.1103
70.0	0.1703	0.1648	0.1484	0.1210	0.0827
80.0	0.1133	0.1094	0.0977	0.0781	0.0508
90.0	0.0627	0.0602	0.0529	0.0408	0.0238
100.0	0.0253	0.0242	0.0208	0.0151	0.0072
110.0	0.0049	0.0047	0.0039	0.0026	0.0008
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	1.5894	1.6025	1.6416	1.7069	1.7981
10.0	1.5493	1.5617	1.5989	1.6609	1.7478
20.0	1.4336	1.4442	1.4759	1.5287	1.6027
30.0	1.2564	1.2641	1.2874	1.3262	1.3805
40.0	1.0390	1.0433	1.0562	1.0777	1.1078
50.0	0.8077	0.8083	0.8102	0.8133	0.8177
60.0	0.5903	0.5875	0.5790	0.5649	0.5451
70.0	0.4040	0.3989	0.3834	0.3575	0.3213
80.0	0.2483	0.2429	0.2265	0.1993	0.1612
90.0	0.1286	0.1246	0.1124	0.0921	0.0637
100.0	0.0491	0.0470	0.0409	0.0308	0.0165
110.0	0.0090	0.0086	0.0071	0.0048	0.0015
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.1184	-0.1206	-0.1272	-0.1375	-0.1507
20.0	-0.2386	-0.2433	-0.2569	-0.2787	-0.3072
30.0	-0.3629	-0.3702	-0.3919	-0.4274	-0.4755
40.0	-0.4942	-0.5044	-0.5354	-0.5878	-0.6628
50.0	-0.6392	-0.6523	-0.6929	-0.7653	-0.8778
60.0	-0.8192	-0.8342	-0.8821	-0.9735	-1.1326
70.0	-1.0779	-1.0933	-1.1440	-1.2484	-1.4590
80.0	-1.4533	-1.4686	-1.5208	-1.6379	-1.9223
90.0	-2.0523	-2.0677	-2.1226	-2.2562	-2.6731
100.0	-3.2083	-3.2229	-3.2834	-3.4423	-4.1484
110.0	-6.5868	-6.6004	-6.6525	-6.8127	-8.1226
120.0	0.	0.	0.	0.	—
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE V. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=1.00

(a) $\theta_{XZ} = 20°$

C_m

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.2280	-0.2271	-0.2209	-0.2040	-0.1711
20.0	-0.4285	-0.4269	-0.4151	-0.3833	-0.3215
30.0	-0.5949	-0.5923	-0.5747	-0.5269	-0.4339
40.0	-0.7386	-0.7349	-0.7091	-0.6386	-0.5018
50.0	-0.8478	-0.8427	-0.8071	-0.7105	-0.5224
60.0	-0.9102	-0.9038	-0.8593	-0.7386	-0.5037
70.0	-0.9187	-0.9115	-0.8604	-0.7215	-0.4515
80.0	-0.8726	-0.8649	-0.8106	-0.6630	-0.3762
90.0	-0.7774	-0.7698	-0.7165	-0.5717	-0.2903
100.0	-0.6446	-0.6377	-0.5896	-0.4590	-0.2051
110.0	-0.4902	-0.4846	-0.4452	-0.3382	-0.1301
120.0	-0.3328	-0.3287	-0.3001	-0.2221	-0.0706
130.0	-0.1912	-0.1888	-0.1711	-0.1232	-0.0300
140.0	-0.0821	-0.0810	-0.0730	-0.0514	-0.0093
150.0	-0.0175	-0.0173	-0.0154	-0.0101	-0.0008
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.3020	0.2926	0.2643	0.2171	0.1511
20.0	0.5676	0.5499	0.4967	0.4079	0.2839
30.0	0.7879	0.7626	0.6867	0.5602	0.3832
40.0	0.9784	0.9449	0.8446	0.6772	0.4431
50.0	1.1229	1.0816	0.9575	0.7506	0.4614
60.0	1.2056	1.1580	1.0154	0.7774	0.4448
70.0	1.2169	1.1658	1.0124	0.7565	0.3988
80.0	1.1558	1.1043	0.9499	0.6923	0.3322
90.0	1.0297	0.9813	0.8363	0.5945	0.2564
100.0	0.8538	0.8117	0.6856	0.4752	0.1812
110.0	0.6493	0.6159	0.5157	0.3485	0.1149
120.0	0.4408	0.4172	0.3462	0.2278	0.0623
130.0	0.2533	0.2391	0.1966	0.1256	0.0265
140.0	0.1088	0.1025	0.0836	0.0522	0.0082
150.0	0.0232	0.0218	0.0176	0.0105	0.0007
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.2340	0.2891	0.4546	0.7307	1.1167
10.0	0.2535	0.3062	0.4642	0.7278	1.0963
20.0	0.3099	0.3554	0.4918	0.7195	1.0377
30.0	0.3873	0.4223	0.5274	0.7026	0.9476
40.0	0.4589	0.4824	0.5526	0.6699	0.8338
50.0	0.5121	0.5242	0.5606	0.6214	0.7063
60.0	0.5389	0.5409	0.5471	0.5574	0.5717
70.0	0.5354	0.5296	0.5120	0.4827	0.4417
80.0	0.5017	0.4906	0.4572	0.4015	0.3237
90.0	0.4415	0.4277	0.3863	0.3173	0.2208
100.0	0.3617	0.3477	0.3059	0.2360	0.1383
110.0	0.2716	0.2596	0.2235	0.1632	0.0789
120.0	0.1819	0.1729	0.1461	0.1013	0.0387
130.0	0.1028	0.0972	0.0806	0.0529	0.0142
140.0	0.0432	0.0407	0.0334	0.0211	0.0040
150.0	0.0089	0.0084	0.0068	0.0041	0.0003
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.8387	0.6668	0.3571	0.1158	-0.0376
20.0	0.8806	0.7570	0.4723	0.1683	-0.0822
30.0	0.6700	0.6014	0.4138	0.1506	-0.1402
40.0	0.4635	0.4236	0.3019	0.0929	-0.2127
50.0	0.2771	0.2520	0.1701	0.0067	-0.3028
60.0	0.1036	0.0868	0.0294	-0.0987	-0.4064
70.0	-0.0655	-0.0775	-0.1197	-0.2225	-0.5301
80.0	-0.2395	-0.2485	-0.2812	-0.3662	-0.6810
90.0	-0.4288	-0.4359	-0.4619	-0.5338	-0.8612
100.0	-0.6484	-0.6541	-0.6756	-0.7375	-1.0862
110.0	-0.9228	-0.9278	-0.9466	-1.0030	-1.4008
120.0	-1.2994	-1.3039	-1.3211	-1.3748	-1.8667
130.0	-1.8875	-1.8910	-1.9049	-1.9501	-2.5079
140.0	-3.0158	-3.0198	-3.0363	-3.0884	-4.0457
150.0	-6.3359	-6.3495	-6.3785	-6.4523	-12.1056
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE V. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=1.00 - Continued

(b) $\theta_{XZ} = 30°$

C_m

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.2281	-0.2271	-0.2209	-0.2039	-0.1710
20.0	-0.4285	-0.4269	-0.4151	-0.3834	-0.3215
30.0	-0.5774	-0.5750	-0.5593	-0.5165	-0.4330
40.0	-0.6686	-0.6658	-0.6466	-0.5947	-0.4934
50.0	-0.7151	-0.7118	-0.6884	-0.6253	-0.5022
60.0	-0.7170	-0.7130	-0.6857	-0.6113	-0.4666
70.0	-0.6756	-0.6712	-0.6411	-0.5593	-0.4000
80.0	-0.5966	-0.5922	-0.5614	-0.4776	-0.3144
90.0	-0.4901	-0.4859	-0.4569	-0.3782	-0.2249
100.0	-0.3687	-0.3651	-0.3405	-0.2737	-0.1434
110.0	-0.2470	-0.2444	-0.2260	-0.1760	-0.0786
120.0	-0.1396	-0.1379	-0.1263	-0.0948	-0.0336
130.0	-0.0585	-0.0577	-0.0524	-0.0379	-0.0097
140.0	-0.0120	-0.0119	-0.0106	-0.0074	-0.0010
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.2565	0.2485	0.2244	0.1844	0.1283
20.0	0.4821	0.4670	0.4218	0.3465	0.2411
30.0	0.6495	0.6292	0.5683	0.4668	0.3248
40.0	0.7521	0.7283	0.6566	0.5372	0.3701
50.0	0.8044	0.7777	0.6975	0.5638	0.3766
60.0	0.8065	0.7780	0.6924	0.5497	0.3500
70.0	0.7600	0.7313	0.6450	0.5012	0.3000
80.0	0.6713	0.6441	0.5624	0.4263	0.2359
90.0	0.5513	0.5274	0.4556	0.3361	0.1687
100.0	0.4147	0.3956	0.3379	0.2420	0.1076
110.0	0.2779	0.2642	0.2232	0.1547	0.0590
120.0	0.1570	0.1488	0.1240	0.0828	0.0252
130.0	0.0658	0.0622	0.0512	0.0329	0.0073
140.0	0.0135	0.0127	0.0103	0.0063	0.0008
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.5000	0.5468	0.6875	0.9218	1.2499
10.0	0.5075	0.5523	0.6866	0.9103	1.2235
20.0	0.5292	0.5679	0.6839	0.8771	1.1475
30.0	0.5625	0.5918	0.6797	0.8262	1.0312
40.0	0.5951	0.6134	0.6683	0.7598	0.8879
50.0	0.6056	0.6134	0.6370	0.6763	0.7313
60.0	0.5869	0.5861	0.5835	0.5793	0.5733
70.0	0.5389	0.5317	0.5102	0.4743	0.4242
80.0	0.4657	0.4550	0.4229	0.3694	0.2946
90.0	0.3750	0.3633	0.3281	0.2695	0.1875
100.0	0.2768	0.2662	0.2343	0.1812	0.1068
110.0	0.1819	0.1738	0.1497	0.1095	0.0532
120.0	0.1006	0.0956	0.0805	0.0555	0.0204
130.0	0.0411	0.0389	0.0321	0.0209	0.0052
140.0	0.0082	0.0077	0.0063	0.0039	0.0005
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.3022	0.2535	0.1424	0.0253	-0.0702
20.0	0.4108	0.3528	0.2065	0.0272	-0.1429
30.0	0.3464	0.3011	0.1745	-0.0092	-0.2220
40.0	0.2061	0.1744	0.0786	-0.0829	-0.3128
50.0	0.0529	0.0303	-0.0420	-0.1797	-0.4193
60.0	-0.1059	-0.1226	-0.1786	-0.2962	-0.5451
70.0	-0.2743	-0.2871	-0.3316	-0.4332	-0.6931
80.0	-0.4610	-0.4714	-0.5083	-0.5988	-0.8791
90.0	-0.6802	-0.6888	-0.7201	-0.8020	-1.1114
100.0	-0.9562	-0.9635	-0.9907	-1.0658	-1.4171
110.0	-1.3368	-1.3436	-1.3691	-1.4434	-1.8864
120.0	-1.9326	-1.9389	-1.9620	-2.0338	-2.6147
130.0	-3.0764	-3.0800	-3.1009	-3.1621	-3.8919
140.0	-6.4273	-6.4362	-6.5020	-6.6124	-10.1629
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE V. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=1.00 - Continued

(c) $\theta_{XZ} = 40°$

C_m

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.2277	-0.2271	-0.2209	-0.2039	-0.1710
20.0	-0.4284	-0.4269	-0.4152	-0.3833	-0.3214
30.0	-0.5773	-0.5751	-0.5593	-0.5165	-0.4330
40.0	-0.6565	-0.6540	-0.6360	-0.5874	-0.4924
50.0	-0.6669	-0.6642	-0.6453	-0.5939	-0.4937
60.0	-0.6288	-0.6260	-0.6058	-0.5511	-0.4447
70.0	-0.5533	-0.5504	-0.5296	-0.4733	-0.3633
80.0	-0.4518	-0.4489	-0.4286	-0.3737	-0.2668
90.0	-0.3372	-0.3346	-0.3167	-0.2680	-0.1734
100.0	-0.2237	-0.2217	-0.2078	-0.1698	-0.0958
110.0	-0.1249	-0.1235	-0.1145	-0.0898	-0.0420
120.0	-0.0515	-0.0508	-0.0465	-0.0347	-0.0117
130.0	-0.0102	-0.0102	-0.0092	-0.0065	-0.0013
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.2007	0.1944	0.1756	0.1443	0.1003
20.0	0.3772	0.3654	0.3300	0.2711	0.1886
30.0	0.5082	0.4923	0.4447	0.3653	0.2541
40.0	0.5779	0.5598	0.5056	0.4154	0.2890
50.0	0.5870	0.5684	0.5126	0.4198	0.2897
60.0	0.5535	0.5352	0.4804	0.3890	0.2610
70.0	0.4871	0.4699	0.4186	0.3330	0.2132
80.0	0.3976	0.3826	0.3374	0.2621	0.1566
90.0	0.2968	0.2846	0.2480	0.1871	0.1017
100.0	0.1969	0.1881	0.1618	0.1178	0.0563
110.0	0.1099	0.1045	0.0885	0.0619	0.0246
120.0	0.0453	0.0429	0.0357	0.0237	0.0069
130.0	0.0091	0.0086	0.0070	0.0044	0.0008
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.8263	0.8630	0.9731	1.1564	1.4132
10.0	0.8191	0.8542	0.9592	1.1342	1.3794
20.0	0.7983	0.8286	0.9193	1.0705	1.2822
30.0	0.7665	0.7894	0.8582	0.9727	1.1332
40.0	0.7274	0.7413	0.7832	0.8529	0.9505
50.0	0.6778	0.6827	0.6972	0.7214	0.7553
60.0	0.6056	0.6031	0.5957	0.5835	0.5663
70.0	0.5121	0.5048	0.4830	0.4466	0.3957
80.0	0.4046	0.3953	0.3672	0.3204	0.2548
90.0	0.2934	0.2842	0.2567	0.2109	0.1467
100.0	0.1894	0.1821	0.1601	0.1236	0.0723
110.0	0.1028	0.0981	0.0842	0.0611	0.0287
120.0	0.0411	0.0390	0.0326	0.0220	0.0071
130.0	0.0080	0.0075	0.0062	0.0039	0.0007
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0659	0.0493	0.0065	-0.0481	-0.1023
20.0	0.0926	0.0664	-0.0044	-0.1013	-0.2059
30.0	0.0620	0.0341	-0.0456	-0.1659	-0.3126
40.0	-0.0268	-0.0514	-0.1255	-0.2499	-0.4263
50.0	-0.1603	-0.1803	-0.2433	-0.3601	-0.5546
60.0	-0.3167	-0.3329	-0.3863	-0.4944	-0.7069
70.0	-0.4971	-0.5106	-0.5563	-0.6566	-0.8906
80.0	-0.7133	-0.7248	-0.7651	-0.8606	-1.1273
90.0	-0.9885	-0.9987	-1.0351	-1.1273	-1.4424
100.0	-1.3705	-1.3796	-1.4129	-1.5028	-1.8897
110.0	-1.9703	-1.9792	-2.0125	-2.1090	-2.6638
120.0	-3.1217	-3.1285	-3.1560	-3.2416	-3.9698
130.0	-6.4892	-6.5059	-6.5405	-6.7401	-9.3214
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE V. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=1.00 - Continued

(d) $\Theta_{XZ} = 50°$

C_m

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.2281	-0.2272	-0.2210	-0.2040	-0.1711
20.0	-0.4286	-0.4269	-0.4152	-0.3833	-0.3215
30.0	-0.5773	-0.5752	-0.5594	-0.5165	-0.4331
40.0	-0.6567	-0.6541	-0.6359	-0.5873	-0.4925
50.0	-0.6567	-0.6541	-0.6359	-0.5873	-0.4925
60.0	-0.5880	-0.5857	-0.5687	-0.5234	-0.4350
70.0	-0.4822	-0.4798	-0.4641	-0.4214	-0.3382
80.0	-0.3594	-0.3575	-0.3432	-0.3046	-0.2293
90.0	-0.2374	-0.2357	-0.2241	-0.1924	-0.1306
100.0	-0.1313	-0.1304	-0.1223	-0.1006	-0.0582
110.0	-0.0536	-0.0529	-0.0491	-0.0381	-0.0167
120.0	-0.0105	-0.0105	-0.0095	-0.0069	-0.0019
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1413	0.1369	0.1236	0.1016	0.0707
20.0	0.2656	0.2573	0.2324	0.1909	0.1328
30.0	0.3578	0.3466	0.3131	0.2572	0.1789
40.0	0.4069	0.3942	0.3560	0.2925	0.2035
50.0	0.4069	0.3942	0.3560	0.2925	0.2035
60.0	0.3644	0.3528	0.3182	0.2605	0.1797
70.0	0.2988	0.2889	0.2590	0.2093	0.1398
80.0	0.2228	0.2148	0.1908	0.1507	0.0947
90.0	0.1471	0.1413	0.1238	0.0947	0.0540
100.0	0.0815	0.0779	0.0671	0.0492	0.0241
110.0	0.0332	0.0316	0.0266	0.0184	0.0069
120.0	0.0065	0.0062	0.0051	0.0033	0.0008
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	1.1736	1.1995	1.2769	1.4061	1.5868
10.0	1.1507	1.1754	1.2493	1.3726	1.5451
20.0	1.0847	1.1060	1.1698	1.2763	1.4253
30.0	0.9835	0.9997	1.0481	1.1288	1.2417
40.0	0.8594	0.8693	0.8987	0.9478	1.0165
50.0	0.7274	0.7305	0.7397	0.7552	0.7769
60.0	0.5951	0.5923	0.5840	0.5701	0.5506
70.0	0.4589	0.4526	0.4336	0.4019	0.3576
80.0	0.3261	0.3187	0.2965	0.2595	0.2077
90.0	0.2066	0.2001	0.1808	0.1485	0.1033
100.0	0.1100	0.1057	0.0927	0.0709	0.0405
110.0	0.0432	0.0411	0.0350	0.0248	0.0104
120.0	0.0082	0.0077	0.0064	0.0042	0.0010
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.0524	-0.0586	-0.0760	-0.1010	-0.1295
20.0	-0.1094	-0.1211	-0.1542	-0.2033	-0.2619
30.0	-0.1765	-0.1921	-0.2376	-0.3089	-0.4000
40.0	-0.2617	-0.2793	-0.3324	-0.4214	-0.5470
50.0	-0.3794	-0.3969	-0.4515	-0.5505	-0.7086
60.0	-0.5435	-0.5593	-0.6107	-0.7118	-0.8980
70.0	-0.7517	-0.7660	-0.8140	-0.9160	-1.1364
80.0	-1.0232	-1.0363	-1.0814	-1.1852	-1.4539
90.0	-1.4040	-1.4161	-1.4596	-1.5674	-1.9135
100.0	-2.0046	-2.0160	-2.0580	-2.1713	-2.6474
110.0	-3.1589	-3.1695	-3.2133	-3.3404	-4.1291
120.0	-6.5462	-6.5450	-6.6082	-6.7384	-8.6334
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE V. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=1.00 - Concluded

(e) $\theta_{XZ} = 60°$

C_m

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.2279	-0.2273	-0.2210	-0.2040	-0.1711
20.0	-0.4285	-0.4268	-0.4150	-0.3835	-0.3215
30.0	-0.5775	-0.5751	-0.5595	-0.5165	-0.4330
40.0	-0.6565	-0.6540	-0.6360	-0.5872	-0.4926
50.0	-0.6565	-0.6540	-0.6360	-0.5872	-0.4926
60.0	-0.5775	-0.5751	-0.5595	-0.5165	-0.4330
70.0	-0.4417	-0.4396	-0.4268	-0.3921	-0.3246
80.0	-0.2945	-0.2931	-0.2827	-0.2543	-0.1995
90.0	-0.1635	-0.1621	-0.1545	-0.1341	-0.0939
100.0	-0.0665	-0.0658	-0.0617	-0.0502	-0.0284
110.0	-0.0132	-0.0128	-0.0118	-0.0087	-0.0031
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0855	0.0828	0.0748	0.0615	0.0428
20.0	0.1607	0.1557	0.1406	0.1155	0.0804
30.0	0.2165	0.2097	0.1894	0.1556	0.1083
40.0	0.2462	0.2385	0.2154	0.1770	0.1231
50.0	0.2462	0.2385	0.2154	0.1770	0.1231
60.0	0.2165	0.2097	0.1894	0.1556	0.1083
70.0	0.1656	0.1603	0.1445	0.1181	0.0811
80.0	0.1104	0.1066	0.0953	0.0763	0.0499
90.0	0.0613	0.0589	0.0518	0.0400	0.0234
100.0	0.0249	0.0238	0.0205	0.0149	0.0071
110.0	0.0049	0.0046	0.0038	0.0026	0.0008
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	1.5000	1.5156	1.5625	1.6406	1.7499
10.0	1.4623	1.4772	1.5220	1.5966	1.7009
20.0	1.3538	1.3667	1.4053	1.4697	1.5599
30.0	1.1875	1.1973	1.2266	1.2754	1.3437
40.0	0.9835	0.9895	1.0073	1.0370	1.0786
50.0	0.7665	0.7683	0.7739	0.7833	0.7964
60.0	0.5625	0.5605	0.5547	0.5449	0.5313
70.0	0.3873	0.3827	0.3689	0.3458	0.3136
80.0	0.2396	0.2345	0.2191	0.1935	0.1577
90.0	0.1250	0.1211	0.1094	0.0898	0.0625
100.0	0.0481	0.0461	0.0401	0.0302	0.0163
110.0	0.0089	0.0085	0.0071	0.0047	0.0015
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.1166	-0.1191	-0.1261	-0.1369	-0.1505
20.0	-0.2351	-0.2401	-0.2546	-0.2774	-0.3067
30.0	-0.3574	-0.3652	-0.3883	-0.4254	-0.4747
40.0	-0.4866	-0.4974	-0.5301	-0.5847	-0.6616
50.0	-0.6295	-0.6433	-0.6859	-0.7609	-0.8758
60.0	-0.8083	-0.8239	-0.8738	-0.9678	-1.1294
70.0	-1.0669	-1.0827	-1.1347	-1.2412	-1.4550
80.0	-1.4420	-1.4575	-1.5104	-1.6306	-1.9162
90.0	-2.0405	-2.0562	-2.1120	-2.2450	-2.6709
100.0	-3.1942	-3.2114	-3.2552	-3.4285	-4.1534
110.0	-6.5485	-6.5819	-6.9773	-6.3489	-7.0506
120.0	0.	0.	0.	0.	—
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VI. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=1.50

(a) $\theta_{XZ} = 20°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1861	-0.1855	-0.1813	-0.1701	-0.1482
20.0	-0.3497	-0.3486	-0.3408	-0.3196	-0.2784
30.0	-0.4872	-0.4855	-0.4733	-0.4402	-0.3759
40.0	-0.6086	-0.6059	-0.5869	-0.5353	-0.4350
50.0	-0.7025	-0.6986	-0.6714	-0.5973	-0.4534
60.0	-0.7582	-0.7532	-0.7182	-0.6229	-0.4378
70.0	-0.7691	-0.7632	-0.7221	-0.6104	-0.3931
80.0	-0.7340	-0.7277	-0.6833	-0.5627	-0.3281
90.0	-0.6572	-0.6509	-0.6068	-0.4869	-0.2539
100.0	-0.5479	-0.5422	-0.5019	-0.3926	-0.1800
110.0	-0.4194	-0.4146	-0.3813	-0.2907	-0.1147
120.0	-0.2870	-0.2835	-0.2590	-0.1923	-0.0626
130.0	-0.1667	-0.1645	-0.1492	-0.1076	-0.0268
140.0	-0.0728	-0.0718	-0.0648	-0.0456	-0.0084
150.0	-0.0160	-0.0158	-0.0141	-0.0096	-0.0008
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.2465	0.2393	0.2176	0.1814	0.1308
20.0	0.4632	0.4497	0.4089	0.3409	0.2459
30.0	0.6454	0.6258	0.5670	0.4690	0.3320
40.0	0.8062	0.7798	0.7007	0.5687	0.3842
50.0	0.9305	0.8974	0.7980	0.6322	0.4004
60.0	1.0043	0.9657	0.8499	0.6567	0.3866
70.0	1.0187	0.9767	0.8508	0.6408	0.3472
80.0	0.9722	0.9296	0.8016	0.5882	0.2898
90.0	0.8705	0.8301	0.7089	0.5068	0.2242
100.0	0.7257	0.6903	0.5840	0.4068	0.1590
110.0	0.5555	0.5271	0.4419	0.2999	0.1013
120.0	0.3801	0.3598	0.2989	0.1973	0.0553
130.0	0.2208	0.2085	0.1715	0.1098	0.0236
140.0	0.0964	0.0909	0.0742	0.0463	0.0074
150.0	0.0212	0.0199	0.0161	0.0097	0.0007
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.1613	0.2109	0.3597	0.6079	0.9549
10.0	0.1782	0.2256	0.3680	0.6056	0.9377
20.0	0.2267	0.2680	0.3920	0.5989	0.8880
30.0	0.2930	0.3254	0.4226	0.5848	0.8115
40.0	0.3546	0.3771	0.4447	0.5573	0.7148
50.0	0.4016	0.4144	0.4528	0.5169	0.6065
60.0	0.4276	0.4316	0.4436	0.4636	0.4916
70.0	0.4292	0.4262	0.4171	0.4019	0.3806
80.0	0.4059	0.3980	0.3743	0.3349	0.2797
90.0	0.3603	0.3498	0.3181	0.2652	0.1913
100.0	0.2979	0.2868	0.2535	0.1979	0.1201
110.0	0.2260	0.2162	0.1867	0.1376	0.0689
120.0	0.1532	0.1457	0.1234	0.0862	0.0341
130.0	0.0879	0.0832	0.0691	0.0455	0.0126
140.0	0.0378	0.0356	0.0292	0.0185	0.0036
150.0	0.0081	0.0076	0.0062	0.0037	0.0003
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.9704	0.7448	0.3757	0.1170	-0.0359
20.0	0.9631	0.8156	0.4922	0.1701	-0.0791
30.0	0.7154	0.6377	0.4307	0.1535	-0.1361
40.0	0.4933	0.4492	0.3172	0.0977	-0.2079
50.0	0.2992	0.2719	0.1840	0.0127	-0.2975
60.0	0.1216	0.1036	0.0425	-0.0914	-0.4007
70.0	-0.0497	-0.0624	-0.1071	-0.2143	-0.5235
80.0	-0.2246	-0.2341	-0.2685	-0.3572	-0.6742
90.0	-0.4140	-0.4214	-0.4487	-0.5233	-0.8531
100.0	-0.6326	-0.6386	-0.6609	-0.7249	-1.0752
110.0	-0.9049	-0.9100	-0.9295	-0.9878	-1.3876
120.0	-1.2774	-1.2821	-1.3000	-1.3557	-1.8537
130.0	-1.8578	-1.8616	-1.8760	-1.9220	-2.4859
140.0	-2.9710	-2.9747	-2.9905	-3.0437	-3.9763
150.0	-6.2647	-6.2640	-6.2912	-6.3808	-11.9115
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VI. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=1.50 - Continued

(b) $\theta_{XZ} = 30°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1906	-0.1900	-0.1857	-0.1738	-0.1508
20.0	-0.3583	-0.3571	-0.3489	-0.3267	-0.2834
30.0	-0.4827	-0.4812	-0.4701	-0.4402	-0.3819
40.0	-0.5602	-0.5583	-0.5446	-0.5075	-0.4352
50.0	-0.6020	-0.5995	-0.5821	-0.5350	-0.4432
60.0	-0.6069	-0.6039	-0.5826	-0.5249	-0.4125
70.0	-0.5753	-0.5719	-0.5477	-0.4821	-0.3544
80.0	-0.5113	-0.5077	-0.4823	-0.4135	-0.2794
90.0	-0.4229	-0.4194	-0.3951	-0.3291	-0.2006
100.0	-0.3207	-0.3177	-0.2967	-0.2396	-0.1285
110.0	-0.2170	-0.2147	-0.1987	-0.1554	-0.0710
120.0	-0.1242	-0.1227	-0.1125	-0.0847	-0.0306
130.0	-0.0530	-0.0524	-0.0475	-0.0344	-0.0089
140.0	-0.0112	-0.0111	-0.0100	-0.0069	-0.0010
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.2145	0.2081	0.1891	0.1575	0.1131
20.0	0.4031	0.3912	0.3555	0.2959	0.2126
30.0	0.5431	0.5271	0.4789	0.3987	0.2864
40.0	0.6302	0.6112	0.5543	0.4593	0.3264
50.0	0.6773	0.6557	0.5910	0.4833	0.3324
60.0	0.6828	0.6595	0.5894	0.4727	0.3094
70.0	0.6472	0.6234	0.5518	0.4327	0.2658
80.0	0.5753	0.5524	0.4838	0.3695	0.2095
90.0	0.4758	0.4554	0.3944	0.2927	0.1504
100.0	0.3608	0.3443	0.2947	0.2121	0.0964
110.0	0.2441	0.2322	0.1964	0.1367	0.0532
120.0	0.1397	0.1324	0.1105	0.0740	0.0229
130.0	0.0597	0.0564	0.0464	0.0299	0.0067
140.0	0.0126	0.0119	0.0097	0.0059	0.0007
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.3592	0.4042	0.5392	0.7642	1.0791
10.0	0.3673	0.4104	0.5397	0.7550	1.0565
20.0	0.3905	0.4281	0.5409	0.7287	0.9916
30.0	0.4262	0.4553	0.5427	0.6882	0.8920
40.0	0.4623	0.4815	0.5391	0.6351	0.7694
50.0	0.4795	0.4892	0.5184	0.5671	0.6352
60.0	0.4720	0.4737	0.4789	0.4874	0.4993
70.0	0.4393	0.4350	0.4222	0.4007	0.3706
80.0	0.3845	0.3766	0.3530	0.3137	0.2586
90.0	0.3136	0.3043	0.2765	0.2302	0.1654
100.0	0.2345	0.2258	0.1996	0.1559	0.0947
110.0	0.1564	0.1496	0.1292	0.0952	0.0477
120.0	0.0881	0.0837	0.0707	0.0489	0.0185
130.0	0.0369	0.0349	0.0289	0.0188	0.0048
140.0	0.0076	0.0072	0.0058	0.0036	0.0005
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.3696	0.3037	0.1640	0.0311	-0.0680
20.0	0.4857	0.4126	0.2366	0.0367	-0.1387
30.0	0.4015	0.3478	0.2021	0.0015	-0.2162
40.0	0.2445	0.2084	0.1015	-0.0721	-0.3059
50.0	0.0822	0.0572	-0.0219	-0.1685	-0.4116
60.0	-0.0815	-0.0997	-0.1600	-0.2844	-0.5366
70.0	-0.2525	-0.2663	-0.3137	-0.4204	-0.6834
80.0	-0.4402	-0.4512	-0.4903	-0.5850	-0.8688
90.0	-0.6591	-0.6681	-0.7010	-0.7863	-1.0992
100.0	-0.9333	-0.9410	-0.9693	-1.0471	-1.4015
110.0	-1.3104	-1.3174	-1.3439	-1.4207	-1.8681
120.0	-1.8996	-1.9057	-1.9299	-2.0037	-2.5919
130.0	-3.0300	-3.0348	-3.0537	-3.1181	-3.8570
140.0	-6.3594	-6.3640	-6.4071	-6.5266	-10.2143
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VI. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=1.50 - Continued

(c) $\theta_{XZ} = 40°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1968	-0.1962	-0.1915	-0.1789	-0.1544
20.0	-0.3699	-0.3687	-0.3600	-0.3363	-0.2901
30.0	-0.4984	-0.4967	-0.4850	-0.4531	-0.3909
40.0	-0.5668	-0.5649	-0.5515	-0.5152	-0.4445
50.0	-0.5766	-0.5745	-0.5602	-0.5214	-0.4458
60.0	-0.5460	-0.5437	-0.5279	-0.4852	-0.4019
70.0	-0.4832	-0.4808	-0.4639	-0.4181	-0.3289
80.0	-0.3972	-0.3948	-0.3778	-0.3319	-0.2424
90.0	-0.2989	-0.2967	-0.2813	-0.2395	-0.1581
100.0	-0.2003	-0.1986	-0.1863	-0.1530	-0.0881
110.0	-0.1132	-0.1121	-0.1039	-0.0818	-0.0388
120.0	-0.0475	-0.0470	-0.0430	-0.0321	-0.0110
130.0	-0.0098	-0.0097	-0.0087	-0.0062	-0.0013
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1733	0.1681	0.1526	0.1268	0.0906
20.0	0.3256	0.3159	0.2868	0.2382	0.1702
30.0	0.4387	0.4256	0.3864	0.3210	0.2294
40.0	0.4989	0.4840	0.4394	0.3650	0.2608
50.0	0.5075	0.4922	0.4460	0.3692	0.2616
60.0	0.4806	0.4653	0.4194	0.3429	0.2358
70.0	0.4253	0.4108	0.3672	0.2947	0.1930
80.0	0.3496	0.3367	0.2978	0.2330	0.1423
90.0	0.2631	0.2525	0.2205	0.1673	0.0928
100.0	0.1763	0.1686	0.1452	0.1062	0.0517
110.0	0.0997	0.0949	0.0804	0.0564	0.0228
120.0	0.0418	0.0396	0.0330	0.0219	0.0064
130.0	0.0086	0.0081	0.0067	0.0042	0.0007
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.6276	0.6661	0.7815	0.9737	1.2430
10.0	0.6240	0.6608	0.7714	0.9556	1.2135
20.0	0.6135	0.6457	0.7423	0.9032	1.1286
30.0	0.5974	0.6224	0.6977	0.8230	0.9985
40.0	0.5776	0.5939	0.6429	0.7246	0.8389
50.0	0.5491	0.5565	0.5789	0.6161	0.6683
60.0	0.4992	0.4994	0.5001	0.5012	0.5028
70.0	0.4288	0.4241	0.4098	0.3861	0.3528
80.0	0.3440	0.3368	0.3151	0.2791	0.2285
90.0	0.2533	0.2457	0.2231	0.1853	0.1324
100.0	0.1662	0.1600	0.1411	0.1098	0.0658
110.0	0.0919	0.0878	0.0756	0.0551	0.0264
120.0	0.0377	0.0357	0.0299	0.0202	0.0066
130.0	0.0075	0.0071	0.0058	0.0037	0.0007
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0966	0.0747	0.0208	-0.0427	-0.1004
20.0	0.1398	0.1064	0.0196	-0.0914	-0.2020
30.0	0.1103	0.0763	-0.0178	-0.1529	-0.3069
40.0	0.0143	-0.0144	-0.0990	-0.2357	-0.4189
50.0	-0.1272	-0.1497	-0.2196	-0.3457	-0.5458
60.0	-0.2884	-0.3062	-0.3643	-0.4796	-0.6969
70.0	-0.4713	-0.4858	-0.5348	-0.6407	-0.8791
80.0	-0.6882	-0.7005	-0.7433	-0.8433	-1.1144
90.0	-0.9627	-0.9734	-1.0116	-1.1076	-1.4270
100.0	-1.3422	-1.3515	-1.3860	-1.4792	-1.8702
110.0	-1.9366	-1.9458	-1.9804	-2.0799	-2.6413
120.0	-3.0774	-3.0846	-3.1124	-3.2007	-3.9361
130.0	-6.4178	-6.4380	-6.4947	-6.6556	-9.2516
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VI. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=1.50 - Continued

(d) $\theta_{XZ} = 50^{\circ}$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2044	-0.2036	-0.1986	-0.1850	-0.1586
20.0	-0.3841	-0.3827	-0.3733	-0.3478	-0.2980
30.0	-0.5175	-0.5157	-0.5030	-0.4686	-0.4015
40.0	-0.5884	-0.5864	-0.5720	-0.5328	-0.4566
50.0	-0.5884	-0.5864	-0.5720	-0.5328	-0.4566
60.0	-0.5276	-0.5257	-0.5121	-0.4752	-0.4034
70.0	-0.4345	-0.4326	-0.4194	-0.3836	-0.3140
80.0	-0.3260	-0.3242	-0.3119	-0.2785	-0.2135
90.0	-0.2171	-0.2157	-0.2053	-0.1771	-0.1222
100.0	-0.1216	-0.1206	-0.1133	-0.0935	-0.0549
110.0	-0.0504	-0.0498	-0.0461	-0.0359	-0.0160
120.0	-0.0102	-0.0100	-0.0091	-0.0067	-0.0018
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1267	0.1228	0.1114	0.0923	0.0655
20.0	0.2380	0.2309	0.2093	0.1734	0.1231
30.0	0.3207	0.3110	0.2820	0.2336	0.1659
40.0	0.3647	0.3537	0.3207	0.2657	0.1887
50.0	0.3647	0.3537	0.3207	0.2657	0.1887
60.0	0.3270	0.3170	0.2869	0.2368	0.1667
70.0	0.2693	0.2605	0.2344	0.1908	0.1298
80.0	0.2020	0.1949	0.1736	0.1380	0.0882
90.0	0.1346	0.1293	0.1136	0.0873	0.0505
100.0	0.0754	0.0721	0.0622	0.0457	0.0227
110.0	0.0312	0.0297	0.0251	0.0174	0.0066
120.0	0.0063	0.0060	0.0049	0.0032	0.0008
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.9531	0.9832	1.0735	1.2242	1.4350
10.0	0.9355	0.9644	1.0510	1.1954	1.3975
20.0	0.8849	0.9102	0.9861	1.1125	1.2895
30.0	0.8074	0.8272	0.8866	0.9856	1.1241
40.0	0.7123	0.7254	0.7645	0.8298	0.9212
50.0	0.6111	0.6170	0.6347	0.6641	0.7053
60.0	0.5082	0.5077	0.5065	0.5044	0.5014
70.0	0.3982	0.3937	0.3804	0.3582	0.3271
80.0	0.2874	0.2814	0.2633	0.2332	0.1911
90.0	0.1852	0.1796	0.1628	0.1349	0.0958
100.0	0.1005	0.0965	0.0848	0.0653	0.0380
110.0	0.0403	0.0384	0.0327	0.0232	0.0099
120.0	0.0078	0.0074	0.0061	0.0040	0.0010
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.0400	-0.0479	-0.0691	-0.0978	-0.1284
20.0	-0.0865	-0.1010	-0.1408	-0.1969	-0.2595
30.0	-0.1465	-0.1654	-0.2190	-0.2993	-0.3960
40.0	-0.2288	-0.2494	-0.3104	-0.4091	-0.5413
50.0	-0.3477	-0.3675	-0.4285	-0.5361	-0.7008
60.0	-0.5148	-0.5322	-0.5883	-0.6963	-0.8882
70.0	-0.7248	-0.7402	-0.7915	-0.8992	-1.1248
80.0	-0.9965	-1.0103	-1.0579	-1.1663	-1.4399
90.0	-1.3758	-1.3886	-1.4338	-1.5455	-1.8970
100.0	-1.9732	-1.9849	-2.0285	-2.1445	-2.6249
110.0	-3.1200	-3.1319	-3.1762	-3.3066	-4.0970
120.0	-6.4981	-6.4801	-6.5310	-6.7597	-8.5258
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VI. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=1.50 - Concluded

(e) $\theta_{XZ} = 60°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.2125	-0.2118	-0.2063	-0.1916	-0.1630
20.0	-0.3994	-0.3980	-0.3878	-0.3602	-0.3064
30.0	-0.5382	-0.5362	-0.5225	-0.4853	-0.4128
40.0	-0.6120	-0.6097	-0.5941	-0.5518	-0.4694
50.0	-0.6120	-0.6097	-0.5941	-0.5518	-0.4694
60.0	-0.5382	-0.5362	-0.5225	-0.4853	-0.4128
70.0	-0.4121	-0.4105	-0.3992	-0.3687	-0.3094
80.0	-0.2760	-0.2747	-0.2653	-0.2399	-0.1905
90.0	-0.1543	-0.1533	-0.1463	-0.1271	-0.0899
100.0	-0.0635	-0.0629	-0.0590	-0.0483	-0.0275
110.0	-0.0126	-0.0125	-0.0114	-0.0086	-0.0030
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0797	0.0773	0.0700	0.0578	0.0408
20.0	0.1498	0.1452	0.1315	0.1086	0.0766
30.0	0.2018	0.1956	0.1772	0.1463	0.1032
40.0	0.2295	0.2225	0.2014	0.1664	0.1174
50.0	0.2295	0.2225	0.2014	0.1664	0.1174
60.0	0.2018	0.1956	0.1772	0.1463	0.1032
70.0	0.1545	0.1497	0.1352	0.1111	0.0773
80.0	0.1035	0.1000	0.0895	0.0721	0.0476
90.0	0.0579	0.0557	0.0490	0.0380	0.0225
100.0	0.0238	0.0227	0.0196	0.0143	0.0069
110.0	0.0047	0.0045	0.0037	0.0025	0.0007
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	1.3093	1.3298	1.3911	1.4933	1.6364
10.0	1.2769	1.2965	1.3553	1.4534	1.5907
20.0	1.1834	1.2006	1.2523	1.3384	1.4589
30.0	1.0402	1.0538	1.0945	1.1623	1.2571
40.0	0.8646	0.8737	0.9009	0.9461	1.0095
50.0	0.6777	0.6820	0.6948	0.7167	0.7461
60.0	0.5021	0.5019	0.5012	0.5001	0.4985
70.0	0.3503	0.3468	0.3365	0.3193	0.2952
80.0	0.2198	0.2154	0.2022	0.1801	0.1492
90.0	0.1165	0.1130	0.1023	0.0845	0.0596
100.0	0.0456	0.0438	0.0382	0.0288	0.0157
110.0	0.0087	0.0082	0.0069	0.0046	0.0015
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.1127	-0.1155	-0.1236	-0.1356	-0.1500
20.0	-0.2269	-0.2328	-0.2494	-0.2747	-0.3056
30.0	-0.3447	-0.3538	-0.3800	-0.4208	-0.4728
40.0	-0.4692	-0.4816	-0.5182	-0.5779	-0.6586
50.0	-0.6078	-0.6232	-0.6702	-0.7513	-0.8711
60.0	-0.7842	-0.8012	-0.8551	-0.9552	-1.1225
70.0	-1.0426	-1.0594	-1.1148	-1.2266	-1.4451
80.0	-1.4170	-1.4333	-1.4889	-1.6123	-1.9042
90.0	-2.0135	-2.0295	-2.0865	-2.2258	-2.6508
100.0	-3.1647	-3.1806	-3.2404	-3.4035	-4.1176
110.0	-6.5397	-6.5549	-6.6132	-6.7926	-7.9275
120.0	0.	0.	0.	0.	—
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VII. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=2.00

(a) $\theta_{XZ} = 20°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1567	-0.1563	-0.1533	-0.1454	-0.1299
20.0	-0.2945	-0.2937	-0.2882	-0.2732	-0.2441
30.0	-0.4114	-0.4101	-0.4011	-0.3768	-0.3296
40.0	-0.5160	-0.5139	-0.4992	-0.4592	-0.3816
50.0	-0.5978	-0.5946	-0.5728	-0.5134	-0.3979
60.0	-0.6473	-0.6432	-0.6144	-0.5364	-0.3847
70.0	-0.6586	-0.6537	-0.6195	-0.5265	-0.3458
80.0	-0.6305	-0.6251	-0.5878	-0.4863	-0.2889
90.0	-0.5663	-0.5609	-0.5235	-0.4217	-0.2239
100.0	-0.4738	-0.4689	-0.4344	-0.3409	-0.1591
110.0	-0.3641	-0.3600	-0.3313	-0.2533	-0.1017
120.0	-0.2505	-0.2474	-0.2262	-0.1683	-0.0558
130.0	-0.1466	-0.1447	-0.1312	-0.0948	-0.0239
140.0	-0.0648	-0.0639	-0.0576	-0.0406	-0.0076
150.0	-0.0146	-0.0144	-0.0129	-0.0087	-0.0007
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.2075	0.2017	0.1843	0.1553	0.1147
20.0	0.3901	0.3792	0.3464	0.2918	0.2156
30.0	0.5449	0.5290	0.4814	0.4020	0.2911
40.0	0.6834	0.6618	0.5968	0.4884	0.3370
50.0	0.7917	0.7642	0.6817	0.5439	0.3514
60.0	0.8573	0.8250	0.7279	0.5660	0.3397
70.0	0.8723	0.8369	0.7306	0.5533	0.3054
80.0	0.8351	0.7988	0.6901	0.5087	0.2557
90.0	0.7501	0.7155	0.6120	0.4392	0.1978
100.0	0.6275	0.5971	0.5058	0.3534	0.1405
110.0	0.4823	0.4578	0.3842	0.2614	0.0898
120.0	0.3318	0.3141	0.2612	0.1728	0.0493
130.0	0.1941	0.1833	0.1509	0.0968	0.0211
140.0	0.0858	0.0809	0.0660	0.0413	0.0067
150.0	0.0193	0.0182	0.0147	0.0088	0.0006
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.1225	0.1665	0.2987	0.5192	0.8274
10.0	0.1371	0.1793	0.3059	0.5172	0.8126
20.0	0.1791	0.2160	0.3268	0.5116	0.7698
30.0	0.2362	0.2654	0.3532	0.4995	0.7041
40.0	0.2893	0.3100	0.3722	0.4759	0.6209
50.0	0.3305	0.3428	0.3797	0.4413	0.5274
60.0	0.3543	0.3589	0.3727	0.3958	0.4281
70.0	0.3576	0.3560	0.3513	0.3433	0.3323
80.0	0.3400	0.3340	0.3162	0.2864	0.2448
90.0	0.3034	0.2949	0.2695	0.2270	0.1677
100.0	0.2522	0.2431	0.2155	0.1696	0.1054
110.0	0.1926	0.1843	0.1596	0.1183	0.0606
120.0	0.1315	0.1252	0.1062	0.0745	0.0303
130.0	0.0762	0.0722	0.0600	0.0396	0.0112
140.0	0.0333	0.0314	0.0258	0.0164	0.0032
150.0	0.0074	0.0069	0.0056	0.0034	0.0003
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	1.0559	0.7918	0.3853	0.1177	-0.0343
20.0	1.0117	0.8488	0.5023	0.1710	-0.0762
30.0	0.7417	0.6582	0.4397	0.1553	-0.1324
40.0	0.5107	0.4641	0.3259	0.1006	-0.2036
50.0	0.3123	0.2838	0.1922	0.0165	-0.2929
60.0	0.1325	0.1138	0.0504	-0.0869	-0.3952
70.0	-0.0400	-0.0532	-0.0994	-0.2093	-0.5186
80.0	-0.2153	-0.2252	-0.2608	-0.3518	-0.6697
90.0	-0.4045	-0.4122	-0.4403	-0.5168	-0.8478
100.0	-0.6224	-0.6285	-0.6514	-0.7168	-1.0674
110.0	-0.8930	-0.8983	-0.9182	-0.9776	-1.3773
120.0	-1.2625	-1.2673	-1.2857	-1.3428	-1.8449
130.0	-1.8370	-1.8406	-1.8553	-1.9026	-2.4684
140.0	-2.9365	-2.9402	-2.9564	-3.0099	-3.9253
150.0	-6.1912	-6.2007	-6.2060	-6.3312	-11 7001
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VII. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=2.00 - Continued

(b) $\Theta_{XZ} = 30°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1627	-0.1622	-0.1591	-0.1505	-0.1337
20.0	-0.3058	-0.3049	-0.2990	-0.2828	-0.2513
30.0	-0.4120	-0.4108	-0.4028	-0.3810	-0.3386
40.0	-0.4789	-0.4775	-0.4673	-0.4397	-0.3860
50.0	-0.5165	-0.5145	-0.5010	-0.4645	-0.3932
60.0	-0.5227	-0.5202	-0.5031	-0.4567	-0.3664
70.0	-0.4975	-0.4946	-0.4747	-0.4206	-0.3154
80.0	-0.4440	-0.4410	-0.4197	-0.3618	-0.2490
90.0	-0.3690	-0.3660	-0.3453	-0.2889	-0.1793
100.0	-0.2813	-0.2787	-0.2606	-0.2113	-0.1153
110.0	-0.1917	-0.1897	-0.1757	-0.1378	-0.0640
120.0	-0.1107	-0.1094	-0.1003	-0.0757	-0.0278
130.0	-0.0480	-0.0473	-0.0430	-0.0312	-0.0082
140.0	-0.0104	-0.0103	-0.0092	-0.0064	-0.0009
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1830	0.1779	0.1623	0.1365	0.1003
20.0	0.3440	0.3343	0.3051	0.2565	0.1885
30.0	0.4635	0.4504	0.4111	0.3456	0.2540
40.0	0.5388	0.5232	0.4764	0.3985	0.2895
50.0	0.5810	0.5631	0.5095	0.4201	0.2950
60.0	0.5880	0.5685	0.5097	0.4118	0.2748
70.0	0.5596	0.5395	0.4788	0.3779	0.2365
80.0	0.4996	0.4800	0.4213	0.3236	0.1868
90.0	0.4151	0.3976	0.3449	0.2572	0.1345
100.0	0.3165	0.3021	0.2590	0.1871	0.0865
110.0	0.2156	0.2052	0.1737	0.1213	0.0480
120.0	0.1245	0.1181	0.0986	0.0662	0.0209
130.0	0.0540	0.0510	0.0420	0.0271	0.0061
140.0	0.0117	0.0110	0.0090	0.0055	0.0007
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.2773	0.3188	0.4434	0.6510	0.9415
10.0	0.2851	0.3249	0.4444	0.6434	0.9219
20.0	0.3075	0.3424	0.4471	0.6215	0.8656
30.0	0.3418	0.3691	0.4512	0.5880	0.7794
40.0	0.3768	0.3953	0.4509	0.5435	0.6732
50.0	0.3956	0.4056	0.4359	0.4862	0.5567
60.0	0.3932	0.3960	0.4045	0.4187	0.4386
70.0	0.3690	0.3663	0.3583	0.3450	0.3264
80.0	0.3255	0.3195	0.3013	0.2710	0.2285
90.0	0.2676	0.2600	0.2373	0.1995	0.1466
100.0	0.2019	0.1945	0.1725	0.1357	0.0843
110.0	0.1360	0.1302	0.1127	0.0835	0.0427
120.0	0.0776	0.0738	0.0624	0.0434	0.0168
130.0	0.0331	0.0313	0.0259	0.0169	0.0043
140.0	0.0070	0.0066	0.0054	0.0033	0.0005
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.4183	0.3384	0.1776	0.0345	-0.0663
20.0	0.5363	0.4518	0.2551	0.0424	-0.1355
30.0	0.4367	0.3771	0.2186	0.0078	-0.2117
40.0	0.2685	0.2295	0.1153	-0.0655	-0.3006
50.0	0.1007	0.0741	-0.0096	-0.1615	-0.4058
60.0	-0.0658	-0.0850	-0.1483	-0.2768	-0.5301
70.0	-0.2382	-0.2527	-0.3021	-0.4121	-0.6762
80.0	-0.4263	-0.4378	-0.4784	-0.5760	-0.8613
90.0	-0.6446	-0.6540	-0.6881	-0.7757	-1.0904
100.0	-0.9173	-0.9252	-0.9543	-1.0338	-1.3892
110.0	-1.2911	-1.2984	-1.3255	-1.4041	-1.8534
120.0	-1.8742	-1.8807	-1.9054	-1.9814	-2.5755
130.0	-2.9910	-2.9971	-3.0157	-3.0790	-3.8043
140.0	-6.2779	-6.2880	-6.3281	-6.4993	-9.9503
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VII. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=2.00 - Continued

(c) $\theta_{XZ} = 40°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1713	-0.1708	-0.1673	-0.1578	-0.1392
20.0	-0.3220	-0.3211	-0.3145	-0.2965	-0.2615
30.0	-0.4339	-0.4326	-0.4237	-0.3995	-0.3524
40.0	-0.4934	-0.4919	-0.4818	-0.4543	-0.4007
50.0	-0.5026	-0.5010	-0.4900	-0.4601	-0.4019
60.0	-0.4775	-0.4757	-0.4631	-0.4290	-0.3626
70.0	-0.4244	-0.4224	-0.4085	-0.3708	-0.2973
80.0	-0.3507	-0.3487	-0.3343	-0.2954	-0.2197
90.0	-0.2656	-0.2637	-0.2503	-0.2142	-0.1438
100.0	-0.1794	-0.1778	-0.1670	-0.1377	-0.0805
110.0	-0.1024	-0.1014	-0.0941	-0.0743	-0.0358
120.0	-0.0436	-0.0431	-0.0395	-0.0296	-0.0102
130.0	-0.0092	-0.0091	-0.0082	-0.0058	-0.0012
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1508	0.1465	0.1335	0.1119	0.0817
20.0	0.2834	0.2753	0.2509	0.2103	0.1535
30.0	0.3819	0.3709	0.3381	0.2834	0.2068
40.0	0.4343	0.4218	0.3845	0.3223	0.2351
50.0	0.4424	0.4295	0.3907	0.3262	0.2359
60.0	0.4203	0.4073	0.3684	0.3036	0.2128
70.0	0.3736	0.3611	0.3238	0.2616	0.1745
80.0	0.3087	0.2975	0.2637	0.2076	0.1289
90.0	0.2338	0.2244	0.1964	0.1497	0.0844
100.0	0.1579	0.1510	0.1302	0.0957	0.0472
110.0	0.0901	0.0858	0.0729	0.0513	0.0210
120.0	0.0384	0.0364	0.0303	0.0202	0.0060
130.0	0.0081	0.0077	0.0063	0.0040	0.0007
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.4973	0.5349	0.6475	0.8351	1.0979
10.0	0.4956	0.5317	0.6398	0.8198	1.0720
20.0	0.4908	0.5224	0.6175	0.7757	0.9974
30.0	0.4833	0.5083	0.5833	0.7082	0.8832
40.0	0.4741	0.4909	0.5413	0.6253	0.7430
50.0	0.4572	0.4657	0.4912	0.5336	0.5931
60.0	0.4207	0.4224	0.4274	0.4357	0.4474
70.0	0.3654	0.3622	0.3528	0.3371	0.3150
80.0	0.2962	0.2905	0.2734	0.2449	0.2050
90.0	0.2205	0.2142	0.1952	0.1636	0.1194
100.0	0.1465	0.1410	0.1248	0.0977	0.0597
110.0	0.0822	0.0785	0.0677	0.0496	0.0243
120.0	0.0343	0.0326	0.0273	0.0185	0.0061
130.0	0.0071	0.0067	0.0055	0.0035	0.0007
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1214	0.0946	0.0312	-0.0389	-0.0988
20.0	0.1765	0.1368	0.0370	-0.0845	-0.1989
30.0	0.1462	0.1073	0.0017	-0.1439	-0.3023
40.0	0.0435	0.0118	-0.0807	-0.2260	-0.4129
50.0	-0.1041	-0.1284	-0.2034	-0.3358	-0.5387
60.0	-0.2685	-0.2875	-0.3490	-0.4692	-0.6889
70.0	-0.4529	-0.4682	-0.5195	-0.6293	-0.8698
80.0	-0.6699	-0.6827	-0.7273	-0.8306	-1.1041
90.0	-0.9432	-0.9543	-0.9938	-1.0927	-1.4147
100.0	-1.3198	-1.3295	-1.3650	-1.4602	-1.8529
110.0	-1.9086	-1.9181	-1.9536	-2.0560	-2.6212
120.0	-3.0383	-3.0468	-3.0755	-3.1654	-3.8984
130.0	-6.3503	-6.3789	-6.4252	-6.6045	-9.1770
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VII. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=2.00 - Continued

(d) $\theta_{XZ} = 50°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1827	-0.1821	-0.1781	-0.1672	-0.1461
20.0	-0.3433	-0.3422	-0.3347	-0.3143	-0.2746
30.0	-0.4625	-0.4611	-0.4510	-0.4235	-0.3699
40.0	-0.5260	-0.5243	-0.5128	-0.4815	-0.4207
50.0	-0.5260	-0.5243	-0.5128	-0.4815	-0.4207
60.0	-0.4722	-0.4707	-0.4597	-0.4298	-0.3717
70.0	-0.3903	-0.3887	-0.3777	-0.3478	-0.2897
80.0	-0.2944	-0.2929	-0.2823	-0.2535	-0.1974
90.0	-0.1976	-0.1962	-0.1871	-0.1621	-0.1135
100.0	-0.1117	-0.1108	-0.1042	-0.0863	-0.0513
110.0	-0.0470	-0.0465	-0.0430	-0.0335	-0.0151
120.0	-0.0097	-0.0096	-0.0087	-0.0064	-0.0018
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1132	0.1099	0.1000	0.0835	0.0604
20.0	0.2128	0.2066	0.1879	0.1569	0.1135
30.0	0.2867	0.2783	0.2532	0.2114	0.1529
40.0	0.3260	0.3165	0.2879	0.2404	0.1738
50.0	0.3260	0.3165	0.2879	0.2404	0.1738
60.0	0.2927	0.2840	0.2579	0.2144	0.1536
70.0	0.2419	0.2342	0.2113	0.1731	0.1197
80.0	0.1825	0.1762	0.1572	0.1257	0.0816
90.0	0.1224	0.1177	0.1036	0.0799	0.0469
100.0	0.0692	0.0662	0.0572	0.0422	0.0212
110.0	0.0291	0.0277	0.0234	0.0162	0.0063
120.0	0.0060	0.0057	0.0047	0.0030	0.0007
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.7843	0.8161	0.9115	1.0705	1.2930
10.0	0.7706	0.8012	0.8928	1.0456	1.2593
20.0	0.7313	0.7582	0.8390	0.9738	1.1624
30.0	0.6710	0.6924	0.7567	0.8639	1.0139
40.0	0.5970	0.6117	0.6557	0.7290	0.8317
50.0	0.5183	0.5258	0.5482	0.5855	0.6378
60.0	0.4369	0.4380	0.4413	0.4469	0.4546
70.0	0.3467	0.3437	0.3345	0.3192	0.2978
80.0	0.2535	0.2486	0.2338	0.2093	0.1749
90.0	0.1655	0.1607	0.1462	0.1220	0.0882
100.0	0.0912	0.0877	0.0772	0.0597	0.0353
110.0	0.0373	0.0355	0.0303	0.0216	0.0093
120.0	0.0075	0.0071	0.0058	0.0038	0.0010
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.0287	-0.0382	-0.0631	-0.0951	-0.1273
20.0	-0.0660	-0.0833	-0.1294	-0.1916	-0.2572
30.0	-0.1204	-0.1424	-0.2034	-0.2915	-0.3924
40.0	-0.2010	-0.2243	-0.2923	-0.3990	-0.5361
50.0	-0.3217	-0.3435	-0.4099	-0.5246	-0.6939
60.0	-0.4916	-0.5104	-0.5703	-0.6838	-0.8796
70.0	-0.7029	-0.7192	-0.7733	-0.8854	-1.1144
80.0	-0.9742	-0.9887	-1.0384	-1.1506	-1.4275
90.0	-1.3518	-1.3648	-1.4116	-1.5265	-1.8813
100.0	-1.9447	-1.9569	-2.0011	-2.1201	-2.6035
110.0	-3.0837	-3.0955	-3.1415	-3.2723	-4.0703
120.0	-6.4459	-6.4464	-6.5202	-6.6806	-8.5353
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VII. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=2.00 - Concluded

(e) $\theta_{XZ} = 60°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1963	-0.1957	-0.1910	-0.1785	-0.1541
20.0	-0.3690	-0.3677	-0.3590	-0.3355	-0.2896
30.0	-0.4971	-0.4954	-0.3590	-0.4520	-0.3901
40.0	-0.5653	-0.5634	-0.5501	-0.5140	-0.4436
50.0	-0.5653	-0.5634	-0.5501	-0.5140	-0.4436
60.0	-0.4971	-0.4954	-0.4837	-0.4520	-0.3901
70.0	-0.3812	-0.3798	-0.3701	-0.3437	-0.2925
80.0	-0.2565	-0.2553	-0.2470	-0.2244	-0.1805
90.0	-0.1445	-0.1436	-0.1371	-0.1196	-0.0855
100.0	-0.0601	-0.0596	-0.0559	-0.0459	-0.0264
110.0	-0.0122	-0.0121	-0.0110	-0.0083	-0.0029
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0736	0.0714	0.0648	0.0539	0.0385
20.0	0.1384	0.1342	0.1219	0.1012	0.0724
30.0	0.1864	0.1809	0.1219	0.1364	0.0975
40.0	0.2120	0.2057	0.1867	0.1551	0.1109
50.0	0.2120	0.2057	0.1867	0.1551	0.1109
60.0	0.1864	0.1809	0.1642	0.1364	0.0975
70.0	0.1429	0.1386	0.1255	0.1037	0.0731
80.0	0.0962	0.0930	0.0834	0.0674	0.0451
90.0	0.0542	0.0521	0.0460	0.0357	0.0214
100.0	0.0225	0.0215	0.0186	0.0136	0.0066
110.0	0.0046	0.0043	0.0036	0.0024	0.0007
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	1.1339	1.1578	1.2296	1.3492	1.5166
10.0	1.1062	1.1292	1.1982	1.3133	1.4743
20.0	1.0264	1.0468	1.1079	1.2098	1.3524
30.0	0.9042	0.9206	1.1079	1.0513	1.1656
40.0	0.7543	0.7657	0.7999	0.8568	0.9365
50.0	0.5948	0.6009	0.6193	0.6499	0.6927
60.0	0.4449	0.4461	0.4496	0.4554	0.4636
70.0	0.3144	0.3119	0.3046	0.2925	0.2754
80.0	0.2000	0.1963	0.1850	0.1662	0.1400
90.0	0.1076	0.1044	0.0948	0.0788	0.0563
100.0	0.0429	0.0412	0.0359	0.0272	0.0150
110.0	0.0083	0.0079	0.0066	0.0044	0.0014
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.1085	-0.1118	-0.1211	-0.1343	-0.1495
20.0	-0.2185	-0.2252	-0.2442	-0.2720	-0.3045
30.0	-0.3317	-0.3421	-0.7442	-0.4164	-0.4709
40.0	-0.4516	-0.4656	-0.5065	-0.5713	-0.6555
50.0	-0.5863	-0.6034	-0.6549	-0.7420	-0.8663
60.0	-0.7609	-0.7793	-0.8373	-0.9432	-1.1153
70.0	-1.0194	-1.0372	-1.0957	-1.2124	-1.4351
80.0	-1.3928	-1.4098	-1.4677	-1.5950	-1.8912
90.0	-1.9865	-2.0031	-2.0618	-2.2043	-2.6330
100.0	-3.1312	-3.1479	-3.2094	-3.3728	-4.0912
110.0	-6.4792	-6.4953	-6.5293	-6.7404	-7.9081
120.0	0.	0.	0.	0.	—
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VIII. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=2.50

(a) $\theta_{XZ} = 20°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1352	-0.1348	-0.1327	-0.1268	-0.1153
20.0	-0.2540	-0.2534	-0.2493	-0.2382	-0.2167
30.0	-0.3556	-0.3546	-0.3477	-0.3290	-0.2926
40.0	-0.4472	-0.4455	-0.4337	-0.4015	-0.3389
50.0	-0.5195	-0.5169	-0.4987	-0.4494	-0.3535
60.0	-0.5637	-0.5603	-0.5360	-0.4702	-0.3421
70.0	-0.5749	-0.5707	-0.5415	-0.4621	-0.3077
80.0	-0.5515	-0.5469	-0.5147	-0.4273	-0.2573
90.0	-0.4964	-0.4917	-0.4593	-0.3711	-0.1996
100.0	-0.4163	-0.4120	-0.3820	-0.3005	-0.1420
110.0	-0.3208	-0.3173	-0.2921	-0.2238	-0.0910
120.0	-0.2215	-0.2188	-0.2001	-0.1492	-0.0502
130.0	-0.1303	-0.1286	-0.1167	-0.0844	-0.0216
140.0	-0.0581	-0.0573	-0.0517	-0.0365	-0.0069
150.0	-0.0133	-0.0131	-0.0118	-0.0080	-0.0007
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1790	0.1742	0.1597	0.1356	0.1018
20.0	0.3364	0.3274	0.3002	0.2548	0.1914
30.0	0.4710	0.4577	0.4178	0.3513	0.2584
40.0	0.5924	0.5741	0.5191	0.4274	0.2993
50.0	0.6880	0.6645	0.5941	0.4765	0.3122
60.0	0.7467	0.7189	0.6356	0.4965	0.3021
70.0	0.7614	0.7308	0.6390	0.4858	0.2718
80.0	0.7304	0.6990	0.6046	0.4472	0.2272
90.0	0.6575	0.6274	0.5372	0.3867	0.1763
100.0	0.5514	0.5248	0.4449	0.3117	0.1254
110.0	0.4250	0.4034	0.3388	0.2311	0.0804
120.0	0.2934	0.2778	0.2311	0.1532	0.0443
130.0	0.1726	0.1630	0.1342	0.0862	0.0190
140.0	0.0769	0.0725	0.0592	0.0371	0.0061
150.0	0.0177	0.0166	0.0134	0.0081	0.0006
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.0985	0.1377	0.2552	0.4513	0.7253
10.0	0.1114	0.1489	0.2616	0.4496	0.7124
20.0	0.1482	0.1812	0.2800	0.4449	0.6753
30.0	0.1981	0.2243	0.3031	0.4345	0.6181
40.0	0.2445	0.2633	0.3198	0.4140	0.5457
50.0	0.2808	0.2923	0.3267	0.3841	0.4643
60.0	0.3023	0.3070	0.3211	0.3446	0.3775
70.0	0.3063	0.3055	0.3032	0.2993	0.2938
80.0	0.2922	0.2875	0.2734	0.2499	0.2170
90.0	0.2617	0.2546	0.2335	0.1982	0.1488
100.0	0.2184	0.2106	0.1872	0.1481	0.0936
110.0	0.1674	0.1603	0.1390	0.1035	0.0539
120.0	0.1149	0.1094	0.0929	0.0655	0.0271
130.0	0.0671	0.0635	0.0528	0.0350	0.0101
140.0	0.0296	0.0279	0.0229	0.0146	0.0029
150.0	0.0067	0.0063	0.0051	0.0031	0.0003
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	1.1152	0.8235	0.3920	0.1189	-0.0326
20.0	1.0435	0.8704	0.5093	0.1727	-0.0731
30.0	0.7587	0.6717	0.4461	0.1577	-0.1283
40.0	0.5222	0.4739	0.3320	0.1036	-0.1991
50.0	0.3210	0.2917	0.1979	0.0197	-0.2883
60.0	0.1398	0.1206	0.0558	-0.0834	-0.3905
70.0	-0.0334	-0.0470	-0.0942	-0.2058	-0.5146
80.0	-0.2090	-0.2191	-0.2555	-0.3482	-0.6665
90.0	-0.3981	-0.4059	-0.4347	-0.5126	-0.8443
100.0	-0.6153	-0.6216	-0.6449	-0.7112	-1.0620
110.0	-0.8947	-0.8901	-0.9103	-0.9704	-1.3695
120.0	-1.2518	-1.2567	-1.2755	-1.3337	-1.8377
130.0	-1.8216	-1.8255	-1.8403	-1.8885	-2.4579
140.0	-2.9110	-2.9144	-2.9304	-2.9835	-3.9003
150.0	-6.1315	-6.1342	-6.1641	-6.2362	-11.4690
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VIII. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=2.50 - Continued

(b) $\theta_{XZ} = 30°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1415	-0.1412	-0.1388	-0.1323	-0.1197
20.0	-0.2660	-0.2654	-0.2609	-0.2486	-0.2249
30.0	-0.3584	-0.3575	-0.3514	-0.3350	-0.3030
40.0	-0.4172	-0.4161	-0.4082	-0.3869	-0.3454
50.0	-0.4511	-0.4495	-0.4387	-0.4093	-0.3521
60.0	-0.4578	-0.4557	-0.4416	-0.4032	-0.3283
70.0	-0.4369	-0.4345	-0.4177	-0.3720	-0.2829
80.0	-0.3912	-0.3886	-0.3703	-0.3205	-0.2237
90.0	-0.3262	-0.3236	-0.3055	-0.2566	-0.1613
100.0	-0.2497	-0.2474	-0.2315	-0.1882	-0.1041
110.0	-0.1709	-0.1692	-0.1568	-0.1233	-0.0581
120.0	-0.0994	-0.0982	-0.0901	-0.0681	-0.0253
130.0	-0.0435	-0.0430	-0.0390	-0.0283	-0.0075
140.0	-0.0097	-0.0095	-0.0086	-0.0060	-0.0009
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1592	0.1549	0.1418	0.1201	0.0897
20.0	0.2992	0.2911	0.2666	0.2258	0.1687
30.0	0.4032	0.3922	0.3592	0.3042	0.2273
40.0	0.4694	0.4562	0.4168	0.3511	0.2591
50.0	0.5074	0.4922	0.4466	0.3705	0.2641
60.0	0.5150	0.4982	0.4478	0.3638	0.2463
70.0	0.4915	0.4741	0.4217	0.3344	0.2122
80.0	0.4401	0.4231	0.3720	0.2869	0.1678
90.0	0.3669	0.3516	0.3054	0.2286	0.1210
100.0	0.2809	0.2682	0.2301	0.1668	0.0781
110.0	0.1923	0.1830	0.1551	0.1086	0.0435
120.0	0.1118	0.1060	0.0886	0.0596	0.0190
130.0	0.0490	0.0463	0.0381	0.0246	0.0056
140.0	0.0109	0.0102	0.0083	0.0051	0.0006
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.2250	0.2628	0.3765	0.5657	0.8305
10.0	0.2323	0.2686	0.3776	0.5592	0.8134
20.0	0.2532	0.2851	0.3809	0.5406	0.7641
30.0	0.2851	0.3103	0.3860	0.5121	0.6885
40.0	0.3179	0.3352	0.3873	0.4740	0.5954
50.0	0.3363	0.3461	0.3756	0.4246	0.4932
60.0	0.3364	0.3397	0.3496	0.3661	0.3892
70.0	0.3175	0.3159	0.3107	0.3023	0.2904
80.0	0.2816	0.2768	0.2622	0.2379	0.2040
90.0	0.2328	0.2264	0.2074	0.1756	0.1312
100.0	0.1767	0.1703	0.1514	0.1198	0.0756
110.0	0.1198	0.1148	0.0995	0.0741	0.0385
120.0	0.0690	0.0656	0.0555	0.0387	0.0152
130.0	0.0298	0.0282	0.0234	0.0153	0.0040
140.0	0.0065	0.0061	0.0050	0.0031	0.0004
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.4543	0.3634	0.1869	0.0371	-0.0647
20.0	0.5720	0.4791	0.2677	0.0466	-0.1326
30.0	0.4606	0.3968	0.2297	0.0125	-0.2077
40.0	0.2847	0.2436	0.1246	-0.0607	-0.2959
50.0	0.1133	0.0855	-0.0011	-0.1564	-0.4006
60.0	-0.0551	-0.0750	-0.1402	-0.2713	-0.5245
70.0	-0.2284	-0.2433	-0.2941	-0.4062	-0.6704
80.0	-0.4166	-0.4284	-0.4701	-0.5697	-0.8558
90.0	-0.6344	-0.6441	-0.6789	-0.7684	-1.0842
100.0	-0.9057	-0.9138	-0.9434	-1.0242	-1.3798
110.0	-1.2769	-1.2842	-1.3119	-1.3917	-1.8412
120.0	-1.8549	-1.8615	-1.8870	-1.9643	-2.5630
130.0	-2.9610	-2.9663	-2.9864	-3.0498	-3.7567
140.0	-6.2390	-6.2475	-6.2808	-6.4182	-10.7698
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VIII. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=2.50 - Continued

(c) $\theta_{XZ} = 40°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1510	-0.1506	-0.1479	-0.1405	-0.1260
20.0	-0.2838	-0.2830	-0.2779	-0.2640	-0.2369
30.0	-0.3823	-0.3814	-0.3744	-0.3557	-0.3191
40.0	-0.4348	-0.4337	-0.4258	-0.4045	-0.3629
50.0	-0.4434	-0.4422	-0.4335	-0.4100	-0.3641
60.0	-0.4224	-0.4210	-0.4107	-0.3829	-0.3287
70.0	-0.3767	-0.3750	-0.3634	-0.3317	-0.2699
80.0	-0.3125	-0.3107	-0.2984	-0.2649	-0.1998
90.0	-0.2377	-0.2361	-0.2244	-0.1928	-0.1311
100.0	-0.1615	-0.1601	-0.1505	-0.1245	-0.0737
110.0	-0.0929	-0.0920	-0.0854	-0.0677	-0.0330
120.0	-0.0401	-0.0396	-0.0363	-0.0272	-0.0095
130.0	-0.0087	-0.0085	-0.0077	-0.0055	-0.0012
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1329	0.1292	0.1182	0.0998	0.0740
20.0	0.2498	0.2429	0.2221	0.1875	0.1390
30.0	0.3365	0.3272	0.2992	0.2526	0.1873
40.0	0.3827	0.3721	0.3403	0.2872	0.2130
50.0	0.3903	0.3793	0.3461	0.2910	0.2136
60.0	0.3718	0.3606	0.3271	0.2712	0.1929
70.0	0.3316	0.3208	0.2883	0.2342	0.1584
80.0	0.2751	0.2652	0.2356	0.1863	0.1172
90.0	0.2093	0.2010	0.1762	0.1348	0.0769
100.0	0.1422	0.1360	0.1174	0.0865	0.0433
110.0	0.0818	0.0779	0.0662	0.0467	0.0194
120.0	0.0353	0.0334	0.0279	0.0186	0.0056
130.0	0.0076	0.0072	0.0059	0.0037	0.0007
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.4091	0.4446	0.5513	0.7289	0.9778
10.0	0.4084	0.4426	0.5451	0.7158	0.9548
20.0	0.4067	0.4368	0.5272	0.6778	0.8887
30.0	0.4040	0.4279	0.4998	0.6196	0.7874
40.0	0.4006	0.4170	0.4663	0.5483	0.6631
50.0	0.3904	0.3992	0.4254	0.4691	0.5302
60.0	0.3624	0.3648	0.3720	0.3841	0.4009
70.0	0.3172	0.3150	0.3086	0.2980	0.2830
80.0	0.2590	0.2544	0.2405	0.2173	0.1849
90.0	0.1943	0.1889	0.1728	0.1458	0.1081
100.0	0.1302	0.1255	0.1112	0.0875	0.0543
110.0	0.0738	0.0706	0.0610	0.0448	0.0223
120.0	0.0313	0.0297	0.0249	0.0169	0.0057
130.0	0.0066	0.0062	0.0051	0.0033	0.0007
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1410	0.1100	0.0390	-0.0361	-0.0975
20.0	0.2045	0.1597	0.0497	-0.0794	-0.1964
30.0	0.1727	0.1299	0.0158	-0.1374	-0.2985
40.0	0.0645	0.0304	-0.0678	-0.2189	-0.4080
50.0	-0.0876	-0.1133	-0.1919	-0.3286	-0.5329
60.0	-0.2542	-0.2741	-0.3381	-0.4616	-0.6824
70.0	-0.4395	-0.4553	-0.5085	-0.6209	-0.8623
80.0	-0.6564	-0.6696	-0.7156	-0.8213	-1.0961
90.0	-0.9286	-0.9399	-0.9806	-1.0816	-1.4052
100.0	-1.3025	-1.3125	-1.3488	-1.4454	-1.8392
110.0	-1.8865	-1.8962	-1.9325	-2.0366	-2.6064
120.0	-3.0056	-3.0127	-3.0416	-3.1345	-3.8689
130.0	-6.3057	-6.3132	-6.3531	-6.5476	-9.0971
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VIII. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=2.50 - Continued

(d) $\theta_{XZ} = 50°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1640	-0.1636	-0.1603	-0.1516	-0.1345
20.0	-0.3083	-0.3074	-0.3013	-0.2849	-0.2529
30.0	-0.4153	-0.4142	-0.4060	-0.3838	-0.3407
40.0	-0.4723	-0.4710	-0.4617	-0.4365	-0.3874
50.0	-0.4723	-0.4710	-0.4617	-0.4365	-0.3874
60.0	-0.4245	-0.4233	-0.4143	-0.3899	-0.3424
70.0	-0.3519	-0.3506	-0.3413	-0.3162	-0.2671
80.0	-0.2667	-0.2654	-0.2562	-0.2311	-0.1825
90.0	-0.1800	-0.1789	-0.1707	-0.1485	-0.1053
100.0	-0.1027	-0.1018	-0.0958	-0.0796	-0.0479
110.0	-0.0437	-0.0432	-0.0400	-0.0313	-0.0143
120.0	-0.0092	-0.0091	-0.0083	-0.0060	-0.0017
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1017	0.0988	0.0901	0.0757	0.0556
20.0	0.1911	0.1856	0.1694	0.1423	0.1045
30.0	0.2574	0.2501	0.2282	0.1918	0.1408
40.0	0.2927	0.2844	0.2596	0.2181	0.1601
50.0	0.2927	0.2844	0.2596	0.2181	0.1601
60.0	0.2631	0.2555	0.2327	0.1947	0.1415
70.0	0.2181	0.2114	0.1912	0.1575	0.1104
80.0	0.1653	0.1597	0.1428	0.1147	0.0754
90.0	0.1116	0.1073	0.0946	0.0733	0.0435
100.0	0.0636	0.0609	0.0527	0.0390	0.0198
110.0	0.0271	0.0257	0.0218	0.0151	0.0059
120.0	0.0057	0.0054	0.0045	0.0029	0.0007
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.6593	0.6911	0.7866	0.9459	1.1687
10.0	0.6484	0.6790	0.7709	0.9240	1.1384
20.0	0.6169	0.6441	0.7255	0.8611	1.0510
30.0	0.5688	0.5906	0.6559	0.7648	0.9172
40.0	0.5097	0.5249	0.5705	0.6466	0.7530
50.0	0.4468	0.4550	0.4797	0.5208	0.5783
60.0	0.3807	0.3827	0.3888	0.3989	0.4131
70.0	0.3051	0.3030	0.2967	0.2862	0.2715
80.0	0.2252	0.2212	0.2090	0.1886	0.1601
90.0	0.1486	0.1444	0.1318	0.1107	0.0813
100.0	0.0829	0.0798	0.0704	0.0547	0.0327
110.0	0.0344	0.0328	0.0280	0.0200	0.0088
120.0	0.0071	0.0067	0.0055	0.0036	0.0009
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.0190	-0.0301	-0.0582	-0.0930	-0.1264
20.0	-0.0488	-0.0686	-0.1202	-0.1874	-0.2553
30.0	-0.0989	-0.1236	-0.1910	-0.2853	-0.3894
40.0	-0.1787	-0.2043	-0.2780	-0.3911	-0.5316
50.0	-0.3014	-0.3248	-0.3956	-0.5156	-0.6879
60.0	-0.4737	-0.4936	-0.5565	-0.6742	-0.8723
70.0	-0.6858	-0.7029	-0.7592	-0.8746	-1.1057
80.0	-0.9566	-0.9716	-1.0230	-1.1380	-1.4169
90.0	-1.3321	-1.3455	-1.3936	-1.5111	-1.8685
100.0	-1.9207	-1.9330	-1.9781	-2.0987	-2.5840
110.0	-3.0506	-3.0630	-3.1080	-3.2445	-4.0498
120.0	-6.3672	-6.3789	-6.4329	-6.6714	-8.5456
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE VIII. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=2. 50 - Concluded

(e) $\theta_{XZ} = 60^\circ$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1809	-0.1804	-0.1764	-0.1658	-0.1450
20.0	-0.3400	-0.3390	-0.3316	-0.3116	-0.2726
30.0	-0.4581	-0.4567	-0.4467	-0.4198	-0.3673
40.0	-0.5209	-0.5193	-0.5080	-0.4773	-0.4176
50.0	-0.5209	-0.5193	-0.5080	-0.4773	-0.4176
60.0	-0.4581	-0.4567	-0.4467	-0.4198	-0.3673
70.0	-0.3517	-0.3505	-0.3422	-0.3195	-0.2754
80.0	-0.2376	-0.2366	-0.2292	-0.2092	-0.1702
90.0	-0.1348	-0.1340	-0.1281	-0.1121	-0.0810
100.0	-0.0567	-0.0562	-0.0528	-0.0434	-0.0252
110.0	-0.0117	-0.0116	-0.0106	-0.0080	-0.0028
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0678	0.0659	0.0599	0.0501	0.0363
20.0	0.1275	0.1238	0.1127	0.0941	0.0681
30.0	0.1718	0.1668	0.1518	0.1268	0.0918
40.0	0.1953	0.1897	0.1726	0.1442	0.1044
50.0	0.1953	0.1897	0.1726	0.1442	0.1044
60.0	0.1718	0.1668	0.1518	0.1268	0.0918
70.0	0.1319	0.1280	0.1161	0.0964	0.0689
80.0	0.0891	0.0862	0.0775	0.0629	0.0426
90.0	0.0506	0.0487	0.0430	0.0335	0.0203
100.0	0.0213	0.0203	0.0175	0.0128	0.0063
110.0	0.0044	0.0042	0.0035	0.0023	0.0007
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.9864	1.0124	1.0903	1.2202	1.4020
10.0	0.9627	0.9877	1.0627	1.1879	1.3629
20.0	0.8942	0.9165	0.9833	1.0946	1.2504
30.0	0.7894	0.8074	0.8616	0.9518	1.0780
40.0	0.6608	0.6737	0.7123	0.7766	0.8665
50.0	0.5240	0.5313	0.5534	0.5901	0.6415
60.0	0.3954	0.3975	0.4040	0.4149	0.4300
70.0	0.2825	0.2809	0.2760	0.2678	0.2563
80.0	0.1819	0.1787	0.1691	0.1532	0.1308
90.0	0.0992	0.0963	0.0876	0.0732	0.0530
100.0	0.0402	0.0386	0.0337	0.0256	0.0143
110.0	0.0080	0.0076	0.0063	0.0043	0.0014
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.1046	-0.1084	-0.1187	-0.1332	-0.1490
20.0	-0.2105	-0.2182	-0.2394	-0.2696	-0.3034
30.0	-0.3196	-0.3313	-0.3641	-0.4124	-0.4691
40.0	-0.4355	-0.4510	-0.4959	-0.5653	-0.6526
50.0	-0.5670	-0.5857	-0.6414	-0.7337	-0.8618
60.0	-0.7404	-0.7601	-0.8217	-0.9327	-1.1086
70.0	-0.9992	-1.0180	-1.0790	-1.2000	-1.4260
80.0	-1.3714	-1.3890	-1.4490	-1.5797	-1.8787
90.0	-1.9616	-1.9788	-2.0391	-2.1847	-2.6170
100.0	-3.1002	-3.1160	-3.1790	-3.3466	-4.0694
110.0	-6.4516	-6.4473	-6.4879	-6.6781	-8.0690
120.0	0.	0.	0.	0.	—
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE IX. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=3.00

(a) $\theta_{XZ} = 20°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1188	-0.1185	-0.1168	-0.1123	-0.1035
20.0	-0.2232	-0.2227	-0.2196	-0.2111	-0.1945
30.0	-0.3129	-0.3122	-0.3067	-0.2918	-0.2628
40.0	-0.3945	-0.3930	-0.3832	-0.3564	-0.3044
50.0	-0.4590	-0.4568	-0.4413	-0.3993	-0.3177
60.0	-0.4990	-0.4960	-0.4750	-0.4182	-0.3076
70.0	-0.5096	-0.5059	-0.4805	-0.4113	-0.2768
80.0	-0.4896	-0.4855	-0.4573	-0.3806	-0.2315
90.0	-0.4414	-0.4373	-0.4087	-0.3309	-0.1797
100.0	-0.3708	-0.3670	-0.3405	-0.2683	-0.1280
110.0	-0.2864	-0.2832	-0.2609	-0.2002	-0.0822
120.0	-0.1983	-0.1959	-0.1792	-0.1337	-0.0454
130.0	-0.1170	-0.1155	-0.1049	-0.0759	-0.0196
140.0	-0.0525	-0.0518	-0.0467	-0.0330	-0.0063
150.0	-0.0122	-0.0120	-0.0108	-0.0073	-0.0006
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1573	0.1532	0.1408	0.1202	0.0914
20.0	0.2956	0.2879	0.2647	0.2259	0.1718
30.0	0.4145	0.4031	0.3689	0.3118	0.2321
40.0	0.5225	0.5066	0.4591	0.3797	0.2688
50.0	0.6080	0.5875	0.5261	0.4237	0.2805
60.0	0.6609	0.6366	0.5636	0.4418	0.2716
70.0	0.6750	0.6480	0.5673	0.4327	0.2444
80.0	0.6485	0.6207	0.5375	0.3986	0.2045
90.0	0.5846	0.5580	0.4782	0.3449	0.1587
100.0	0.4912	0.4675	0.3966	0.2784	0.1131
110.0	0.3793	0.3602	0.3026	0.2067	0.0726
120.0	0.2626	0.2487	0.2070	0.1374	0.0401
130.0	0.1550	0.1464	0.1206	0.0775	0.0173
140.0	0.0695	0.0655	0.0535	0.0335	0.0056
150.0	0.0162	0.0152	0.0123	0.0074	0.0006
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.0824	0.1174	0.2224	0.3976	0.6426
10.0	0.0938	0.1274	0.2281	0.3963	0.6313
20.0	0.1265	0.1560	0.2446	0.3922	0.5987
30.0	0.1707	0.1943	0.2651	0.3833	0.5485
40.0	0.2118	0.2289	0.2801	0.3655	0.4849
50.0	0.2442	0.2547	0.2864	0.3393	0.4132
60.0	0.2636	0.2682	0.2819	0.3047	0.3366
70.0	0.2678	0.2675	0.2666	0.2650	0.2627
80.0	0.2561	0.2523	0.2408	0.2215	0.1946
90.0	0.2300	0.2239	0.2059	0.1758	0.1336
100.0	0.1924	0.1856	0.1653	0.1314	0.0840
110.0	0.1479	0.1417	0.1230	0.0920	0.0485
120.0	0.1019	0.0970	0.0825	0.0583	0.0245
130.0	0.0598	0.0566	0.0471	0.0313	0.0091
140.0	0.0266	0.0251	0.0206	0.0131	0.0027
150.0	0.0061	0.0057	0.0046	0.0028	0.0003
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	1.1586	0.8468	0.3977	0.1206	-0.0307
20.0	1.0659	0.8860	0.5153	0.1753	-0.0697
30.0	0.7707	0.6814	0.4514	0.1607	-0.1240
40.0	0.5302	0.4810	0.3368	0.1068	-0.1943
50.0	0.3772	0.2974	0.2023	0.0229	-0.2835
60.0	0.1450	0.1255	0.0599	-0.0804	-0.3859
70.0	-0.0287	-0.0425	-0.0904	-0.2031	-0.5110
80.0	-0.2044	-0.2148	-0.2518	-0.3456	-0.6639
90.0	-0.3933	-0.4013	-0.4306	-0.5095	-0.8419
100.0	-0.6102	-0.6165	-0.6401	-0.7072	-1.0580
110.0	-0.8786	-0.8840	-0.9044	-0.9651	-1.3631
120.0	-1.2440	-1.2489	-1.2679	-1.3270	-1.8329
130.0	-1.8102	-1.8142	-1.8292	-1.8777	-2.4500
140.0	-2.8903	-2.8952	-2.9110	-2.9643	-3.8632
150.0	-6.0753	-6.0739	-6.1127	-6.2160	-10.4228
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE IX. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=3.00 - Continued

(b) $\theta_{XZ} = 30°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1251	-0.1248	-0.1229	-0.1179	-0.1081
20.0	-0.2351	-0.2346	-0.2311	-0.2216	-0.2031
30.0	-0.3167	-0.3160	-0.3113	-0.2985	-0.2736
40.0	-0.3691	-0.3682	-0.3620	-0.3450	-0.3120
50.0	-0.3999	-0.3986	-0.3896	-0.3654	-0.3181
60.0	-0.4067	-0.4050	-0.3929	-0.3603	-0.2969
70.0	-0.3890	-0.3869	-0.3724	-0.3329	-0.2560
80.0	-0.3490	-0.3468	-0.3307	-0.2873	-0.2026
90.0	-0.2917	-0.2895	-0.2736	-0.2304	-0.1463
100.0	-0.2240	-0.2219	-0.2078	-0.1694	-0.0946
110.0	-0.1539	-0.1523	-0.1413	-0.1113	-0.0529
120.0	-0.0899	-0.0889	-0.0816	-0.0618	-0.0232
130.0	-0.0397	-0.0392	-0.0356	-0.0259	-0.0069
140.0	-0.0090	-0.0088	-0.0080	-0.0055	-0.0008
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1407	0.1370	0.1258	0.1071	0.0810
20.0	0.2645	0.2575	0.2364	0.2014	0.1523
30.0	0.3563	0.3469	0.3185	0.2713	0.2052
40.0	0.4153	0.4039	0.3699	0.3133	0.2340
50.0	0.4499	0.4367	0.3970	0.3310	0.2386
60.0	0.4575	0.4428	0.3988	0.3254	0.2227
70.0	0.4376	0.4223	0.3762	0.2995	0.1920
80.0	0.3927	0.3776	0.3325	0.2573	0.1520
90.0	0.3282	0.3146	0.2736	0.2053	0.1098
100.0	0.2520	0.2407	0.2067	0.1501	0.0709
110.0	0.1731	0.1648	0.1398	0.0981	0.0397
120.0	0.1012	0.0960	0.0802	0.0541	0.0174
130.0	0.0447	0.0422	0.0348	0.0225	0.0052
140.0	0.0101	0.0095	0.0077	0.0048	0.0006
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.1890	0.2234	0.3268	0.4989	0.7399
10.0	0.1957	0.2287	0.3280	0.4933	0.7248
20.0	0.2150	0.2441	0.3316	0.4772	0.6811
30.0	0.2446	0.2677	0.3370	0.4525	0.6142
40.0	0.2749	0.2909	0.3391	0.4194	0.5317
50.0	0.2925	0.3017	0.3296	0.3761	0.4412
60.0	0.2939	0.2973	0.3076	0.3248	0.3488
70.0	0.2785	0.2774	0.2741	0.2686	0.2608
80.0	0.2479	0.2439	0.2319	0.2119	0.1838
90.0	0.2057	0.2003	0.1839	0.1566	0.1185
100.0	0.1568	0.1513	0.1347	0.1070	0.0683
110.0	0.1069	0.1024	0.0889	0.0664	0.0350
120.0	0.0619	0.0589	0.0499	0.0349	0.0139
130.0	0.0271	0.0256	0.0212	0.0139	0.0036
140.0	0.0060	0.0057	0.0046	0.0029	0.0004
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.4817	0.3822	0.1941	0.0394	-0.0633
20.0	0.5982	0.4991	0.2771	0.0503	-0.1298
30.0	0.4777	0.4110	0.2379	0.0165	-0.2039
40.0	0.2962	0.2538	0.1315	-0.0566	-0.2914
50.0	0.1223	0.0937	0.0052	-0.1521	-0.3958
60.0	-0.0474	-0.0678	-0.1342	-0.2669	-0.5194
70.0	-0.2212	-0.2364	-0.2882	-0.4017	-0.6654
80.0	-0.4094	-0.4216	-0.4640	-0.5651	-0.8515
90.0	-0.6268	-0.6366	-0.6722	-0.7630	-1.0794
100.0	-0.8971	-0.9052	-0.9353	-1.0171	-1.3727
110.0	-1.2662	-1.2736	-1.3017	-1.3824	-1.8317
120.0	-1.8397	-1.8466	-1.8724	-1.9511	-2.5532
130.0	-2.9367	-2.9426	-2.9616	-3.0277	-3.7300
140.0	-6.1719	-6.1769	-6.2193	-6.3768	-9.7008
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE IX. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=3.00 - Continued

(c) $\theta_{XZ} = 40°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1347	-0.1344	-0.1322	-0.1263	-0.1148
20.0	-0.2531	-0.2525	-0.2484	-0.2374	-0.2158
30.0	-0.3410	-0.3402	-0.3347	-0.3198	-0.2908
40.0	-0.3878	-0.3869	-0.3806	-0.3637	-0.3307
50.0	-0.3959	-0.3949	-0.3879	-0.3689	-0.3318
60.0	-0.3779	-0.3767	-0.3681	-0.3449	-0.2997
70.0	-0.3379	-0.3364	-0.3264	-0.2993	-0.2464
80.0	-0.2811	-0.2796	-0.2688	-0.2396	-0.1826
90.0	-0.2146	-0.2131	-0.2028	-0.1748	-0.1201
100.0	-0.1464	-0.1452	-0.1366	-0.1133	-0.0678
110.0	-0.0848	-0.0839	-0.0780	-0.0619	-0.0305
120.0	-0.0369	-0.0365	-0.0334	-0.0251	-0.0089
130.0	-0.0081	-0.0080	-0.0072	-0.0052	-0.0011
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1185	0.1153	0.1057	0.0898	0.0674
20.0	0.2228	0.2168	0.1987	0.1687	0.1267
30.0	0.3001	0.2920	0.2678	0.2273	0.1707
40.0	0.3413	0.3321	0.3045	0.2585	0.1941
50.0	0.3485	0.3389	0.3100	0.2620	0.1947
60.0	0.3326	0.3228	0.2934	0.2445	0.1759
70.0	0.2974	0.2879	0.2592	0.2114	0.1446
80.0	0.2474	0.2387	0.2124	0.1685	0.1072
90.0	0.1889	0.1815	0.1593	0.1223	0.0705
100.0	0.1289	0.1233	0.1066	0.0788	0.0398
110.0	0.0746	0.0711	0.0604	0.0427	0.0179
120.0	0.0325	0.0308	0.0257	0.0171	0.0052
130.0	0.0071	0.0067	0.0055	0.0035	0.0006
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.3463	0.3795	0.4793	0.6454	0.8780
10.0	0.3463	0.3782	0.4741	0.6338	0.8575
20.0	0.3463	0.3746	0.4594	0.6006	0.7984
30.0	0.3464	0.3689	0.4367	0.5496	0.7078
40.0	0.3464	0.3620	0.4090	0.4872	0.5967
50.0	0.3403	0.3489	0.3746	0.4176	0.4778
60.0	0.3178	0.3206	0.3289	0.3427	0.3620
70.0	0.2797	0.2782	0.2738	0.2665	0.2562
80.0	0.2297	0.2258	0.2142	0.1950	0.1679
90.0	0.1733	0.1686	0.1546	0.1312	0.0985
100.0	0.1169	0.1127	0.1001	0.0791	0.0497
110.0	0.0668	0.0639	0.0553	0.0408	0.0205
120.0	0.0287	0.0272	0.0228	0.0155	0.0053
130.0	0.0062	0.0058	0.0048	0.0031	0.0006
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.1565	0.1220	0.0449	-0.0338	-0.0964
20.0	0.2263	0.1774	0.0593	-0.0753	-0.1941
30.0	0.1928	0.1470	0.0264	-0.1322	-0.2951
40.0	0.0801	0.0442	-0.0582	-0.2134	-0.4037
50.0	-0.0755	-0.1022	-0.1834	-0.3229	-0.5278
60.0	-0.2437	-0.2642	-0.3299	-0.4557	-0.6768
70.0	-0.4295	-0.4458	-0.5002	-0.6144	-0.8560
80.0	-0.6461	-0.6597	-0.7068	-0.8143	-1.0897
90.0	-0.9173	-0.9290	-0.9704	-1.0730	-1.3978
100.0	-1.2892	-1.2993	-1.3361	-1.4339	-1.8279
110.0	-1.8688	-1.8786	-1.9158	-2.0212	-2.5914
120.0	-2.9778	-2.9868	-3.0169	-3.1072	-3.8493
130.0	-6.2640	-6.2533	-6.2838	-6.4319	-9.6848
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE IX. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=3.00 - Continued

(d) $\theta_{XZ} = 50°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1483	-0.1479	-0.1453	-0.1381	-0.1242
20.0	-0.2787	-0.2780	-0.2731	-0.2596	-0.2335
30.0	-0.3755	-0.3746	-0.3679	-0.3498	-0.3146
40.0	-0.4270	-0.4259	-0.4184	-0.3978	-0.3577
50.0	-0.4270	-0.4259	-0.4184	-0.3978	-0.3577
60.0	-0.3843	-0.3832	-0.3757	-0.3555	-0.3162
70.0	-0.3194	-0.3182	-0.3103	-0.2888	-0.2469
80.0	-0.2429	-0.2417	-0.2336	-0.2117	-0.1689
90.0	-0.1647	-0.1637	-0.1564	-0.1365	-0.0978
100.0	-0.0946	-0.0938	-0.0883	-0.0735	-0.0447
110.0	-0.0406	-0.0402	-0.0372	-0.0291	-0.0134
120.0	-0.0087	-0.0086	-0.0078	-0.0057	-0.0016
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0919	0.0894	0.0818	0.0691	0.0513
20.0	0.1727	0.1680	0.1537	0.1298	0.0965
30.0	0.2327	0.2263	0.2070	0.1749	0.1300
40.0	0.2647	0.2573	0.2354	0.1989	0.1478
50.0	0.2647	0.2573	0.2354	0.1989	0.1478
60.0	0.2381	0.2314	0.2113	0.1777	0.1306
70.0	0.1979	0.1919	0.1739	0.1440	0.1020
80.0	0.1505	0.1455	0.1303	0.1051	0.0698
90.0	0.1021	0.0982	0.0867	0.0674	0.0404
100.0	0.0586	0.0561	0.0486	0.0360	0.0185
110.0	0.0252	0.0239	0.0203	0.0141	0.0055
120.0	0.0054	0.0051	0.0042	0.0027	0.0007
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.5656	0.5967	0.6897	0.8448	1.0619
10.0	0.5567	0.5866	0.6761	0.8254	1.0344
20.0	0.5309	0.5574	0.6370	0.7696	0.9552
30.0	0.4914	0.5128	0.5770	0.6841	0.8339
40.0	0.4430	0.4581	0.5035	0.5792	0.6851
50.0	0.3914	0.3999	0.4253	0.4676	0.5268
60.0	0.3363	0.3388	0.3465	0.3593	0.3771
70.0	0.2716	0.2702	0.2658	0.2586	0.2485
80.0	0.2020	0.1986	0.1883	0.1711	0.1472
90.0	0.1344	0.1307	0.1195	0.1010	0.0750
100.0	0.0757	0.0728	0.0644	0.0502	0.0304
110.0	0.0319	0.0304	0.0260	0.0186	0.0083
120.0	0.0067	0.0063	0.0052	0.0034	0.0009
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.0109	-0.0233	-0.0542	-0.0913	-0.1256
20.0	-0.0345	-0.0565	-0.1128	-0.1840	-0.2537
30.0	-0.0815	-0.1084	-0.1810	-0.2803	-0.3867
40.0	-0.1609	-0.1885	-0.2668	-0.3848	-0.5278
50.0	-0.2855	-0.3102	-0.3844	-0.5085	-0.6829
60.0	-0.4598	-0.4805	-0.5458	-0.6666	-0.8660
70.0	-0.6724	-0.6901	-0.7481	-0.8660	-1.0982
80.0	-0.9427	-0.9581	-1.0109	-1.1281	-1.4082
90.0	-1.3161	-1.3300	-1.3793	-1.4986	-1.8574
100.0	-1.9006	-1.9129	-1.9596	-2.0818	-2.5677
110.0	-3.0216	-3.0342	-3.0827	-3.2161	-4.0415
120.0	-6.3414	-6.3370	-6.3769	-6.5191	-8.5569
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE IX. - LONGITUDINAL AERODYNAMICS OF BLUNTED ELLIPTICAL CONES m=3.00 - Concluded

(e) $\theta_{XZ} = 60°$

C_m

α \ ξ	0	25	50	75	100
0.	-0.	-0.	-0.	-0.	-0.
10.0	-0.1669	-0.1664	-0.1631	-0.1540	-0.1364
20.0	-0.3137	-0.3128	-0.3065	-0.2895	-0.2563
30.0	-0.4227	-0.4214	-0.4130	-0.3900	-0.3453
40.0	-0.4806	-0.4793	-0.4696	-0.4435	-0.3927
50.0	-0.4806	-0.4793	-0.4696	-0.4435	-0.3927
60.0	-0.4227	-0.4214	-0.4130	-0.3900	-0.3453
70.0	-0.3249	-0.3239	-0.3167	-0.2971	-0.2590
80.0	-0.2204	-0.2194	-0.2129	-0.1950	-0.1604
90.0	-0.1258	-0.1250	-0.1196	-0.1050	-0.0766
100.0	-0.0534	-0.0530	-0.0497	-0.0410	-0.0240
110.0	-0.0112	-0.0111	-0.0102	-0.0076	-0.0027
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_N

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	0.0626	0.0608	0.0555	0.0466	0.0341
20.0	0.1176	0.1143	0.1042	0.0875	0.0641
30.0	0.1585	0.1540	0.1405	0.1179	0.0863
40.0	0.1802	0.1751	0.1597	0.1341	0.0982
50.0	0.1802	0.1751	0.1597	0.1341	0.0982
60.0	0.1585	0.1540	0.1405	0.1179	0.0863
70.0	0.1219	0.1183	0.1076	0.0897	0.0648
80.0	0.0826	0.0800	0.0720	0.0587	0.0401
90.0	0.0472	0.0454	0.0402	0.0314	0.0192
100.0	0.0200	0.0192	0.0165	0.0121	0.0060
110.0	0.0042	0.0040	0.0033	0.0022	0.0007
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

C_A

α \ ξ	0	25	50	75	100
0.	0.8660	0.8930	0.9738	1.1085	1.2971
10.0	0.8455	0.8714	0.9494	1.0792	1.2610
20.0	0.7861	0.8093	0.8789	0.9948	1.1570
30.0	0.6953	0.7142	0.7709	0.8654	0.9977
40.0	0.5838	0.5975	0.6385	0.7068	0.8023
50.0	0.4652	0.4733	0.4975	0.5379	0.5944
60.0	0.3538	0.3566	0.3651	0.3792	0.3990
70.0	0.2553	0.2542	0.2511	0.2458	0.2384
80.0	0.1660	0.1633	0.1550	0.1414	0.1222
90.0	0.0915	0.0889	0.0811	0.0681	0.0498
100.0	0.0376	0.0361	0.0316	0.0241	0.0136
110.0	0.0076	0.0072	0.0061	0.0041	0.0013
120.0	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.
140.0	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.
160.0	0.	0.	0.	0.	0.
170.0	0.	0.	0.	0.	0.
180.0	0.	0.	0.	0.	0.

L/D

α \ ξ	0	25	50	75	100
0.	0.	0.	0.	0.	0.
10.0	-0.1010	-0.1053	-0.1167	-0.1322	-0.1486
20.0	-0.2033	-0.2119	-0.2352	-0.2674	-0.3025
30.0	-0.3088	-0.3217	-0.3575	-0.4090	-0.4674
40.0	-0.4213	-0.4383	-0.4868	-0.5602	-0.6500
50.0	-0.5503	-0.5703	-0.6298	-0.7266	-0.8577
60.0	-0.7230	-0.7439	-0.8086	-0.9238	-1.1025
70.0	-0.9821	-1.0016	-1.0651	-1.1894	-1.4178
80.0	-1.3532	-1.3715	-1.4330	-1.5666	-1.8681
90.0	-1.9404	-1.9577	-2.0192	-2.1671	-2.6018
100.0	-3.0697	-3.0880	-3.1511	-3.3236	-4.0504
110.0	-6.3754	-6.4403	-6.4678	-6.6117	-7.8548
120.0	0.	0.	0.	0.	—
130.0	0.	0.	0.	0.	—
140.0	0.	0.	0.	0.	—
150.0	0.	0.	0.	0.	—
160.0	0.	0.	0.	0.	—
170.0	0.	0.	0.	0.	—
180.0	0.	0.	0.	0.	—

TABLE X. - DIRECTIONAL STABILITY DERIVATIVES

(a) $\theta_{XZ} = 20°$

C_{Y_β}

m \ ξ	0	25	50	75	100
0.25	-0.0066	-0.0063	-0.0054	-0.0040	-0.0019
0.50	-0.0168	-0.0161	-0.0141	-0.0108	-0.0062
0.75	-0.0248	-0.0239	-0.0213	-0.0170	-0.0109
1.00	-0.0308	-0.0299	-0.0270	-0.0221	-0.0154
1.50	-0.0390	-0.0380	-0.0350	-0.0301	-0.0231
2.00	-0.0443	-0.0434	-0.0406	-0.0358	-0.0292
2.50	-0.0481	-0.0472	-0.0446	-0.0402	-0.0341
3.00	-0.0509	-0.0501	-0.0477	-0.0437	-0.0380

C_{n_β}

m \ ξ	0	25	50	75	100
0.25	0.0136	0.0136	0.0130	0.0115	0.0086
0.50	0.0171	0.0170	0.0164	0.0146	0.0112
0.75	0.0204	0.0203	0.0197	0.0179	0.0143
1.00	0.0233	0.0231	0.0226	0.0208	0.0175
1.50	0.0275	0.0275	0.0270	0.0256	0.0230
2.00	0.0305	0.0305	0.0302	0.0293	0.0275
2.50	0.0327	0.0327	0.0325	0.0321	0.0312
3.00	0.0344	0.0344	0.0344	0.0343	0.0342

TABLE X. - DIRECTIONAL STABILITY DERIVATIVES - Continued

(b) $\theta_{XZ} = 30°$

C_{Y_β}

m \ ξ	0	25	50	75	100
0.25	-0.0039	-0.0037	-0.0033	-0.0025	-0.0014
0.50	-0.0119	-0.0112	-0.0101	-0.0079	-0.0047
0.75	-0.0197	-0.0191	-0.0170	-0.0136	-0.0089
1.00	-0.0262	-0.0254	-0.0229	-0.0188	-0.0131
1.50	-0.0354	-0.0345	-0.0317	-0.0271	-0.0206
2.00	-0.0414	-0.0405	-0.0378	-0.0332	-0.0267
2.50	-0.0457	-0.0448	-0.0422	-0.0378	-0.0317
3.00	-0.0488	-0.0480	-0.0456	-0.0415	-0.0357

C_{n_β}

m \ ξ	0	25	50	75	100
0.25	0.0164	0.0163	0.0157	0.0141	0.0110
0.50	0.0185	0.0182	0.0178	0.0161	0.0128
0.75	0.0210	0.0209	0.0202	0.0185	0.0150
1.00	0.0232	0.0232	0.0225	0.0208	0.0174
1.50	0.0271	0.0270	0.0264	0.0250	0.0220
2.00	0.0299	0.0299	0.0294	0.0283	0.0260
2.50	0.0321	0.0320	0.0317	0.0309	0.0293
3.00	0.0338	0.0337	0.0336	0.0330	0.0320

TABLE X. - DIRECTIONAL STABILITY DERIVATIVES - Continued

(c) $\Theta_{XZ} = 40°$

C_{Y_β}

m \ ξ	0	25	50	75	100
0.25	-0.0023	-0.0022	-0.0019	-0.0015	-0.0009
0.50	-0.0078	-0.0075	-0.0067	-0.0053	-0.0034
0.75	-0.0144	-0.0139	-0.0124	-0.0100	-0.0066
1.00	-0.0205	-0.0198	-0.0179	-0.0147	-0.0102
1.50	-0.0302	-0.0294	-0.0270	-0.0229	-0.0172
2.00	-0.0371	-0.0362	-0.0336	-0.0292	-0.0231
2.50	-0.0420	-0.0411	-0.0385	-0.0342	-0.0281
3.00	-0.0456	-0.0448	-0.0423	-0.0381	-0.0323

C_{n_β}

m \ ξ	0	25	50	75	100
0.25	0.0187	0.0186	0.0180	0.0163	0.0131
0.50	0.0199	0.0198	0.0192	0.0175	0.0141
0.75	0.0215	0.0215	0.0208	0.0191	0.0157
1.00	0.0233	0.0232	0.0225	0.0208	0.0175
1.50	0.0264	0.0264	0.0258	0.0242	0.0211
2.00	0.0290	0.0290	0.0285	0.0271	0.0244
2.50	0.0311	0.0311	0.0306	0.0295	0.0273
3.00	0.0328	0.0327	0.0324	0.0315	0.0298

TABLE X. - DIRECTIONAL STABILITY DERIVATIVES - Continued

(d) $\Theta_{XZ} = 50°$

C_{Y_β}

m \ ξ	0	25	50	75	100
0.25	-0.0013	-0.0012	-0.0011	-0.0009	-0.0006
0.50	-0.0047	-0.0046	-0.0041	-0.0033	-0.0022
0.75	-0.0094	-0.0091	-0.0082	-0.0066	-0.0045
1.00	-0.0144	-0.0140	-0.0126	-0.0104	-0.0072
1.50	-0.0236	-0.0230	-0.0210	-0.0177	-0.0130
2.00	-0.0309	-0.0301	-0.0278	-0.0239	-0.0185
2.50	-0.0364	-0.0356	-0.0331	-0.0291	-0.0233
3.00	-0.0407	-0.0399	-0.0374	-0.0333	-0.0275

C_{n_β}

m \ ξ	0	25	50	75	100
0.25	0.0204	0.0203	0.0197	0.0180	0.0147
0.50	0.0211	0.0210	0.0204	0.0187	0.0153
0.75	0.0221	0.0220	0.0214	0.0196	0.0163
1.00	0.0234	0.0231	0.0226	0.0207	0.0174
1.50	0.0257	0.0256	0.0250	0.0233	0.0201
2.00	0.0279	0.0278	0.0272	0.0257	0.0227
2.50	0.0298	0.0297	0.0292	0.0279	0.0252
3.00	0.0314	0.0313	0.0309	0.0297	0.0274

TABLE X. - DIRECTIONAL STABILITY DERIVATIVES - Concluded

(e) $\Theta_{XZ} = 60°$

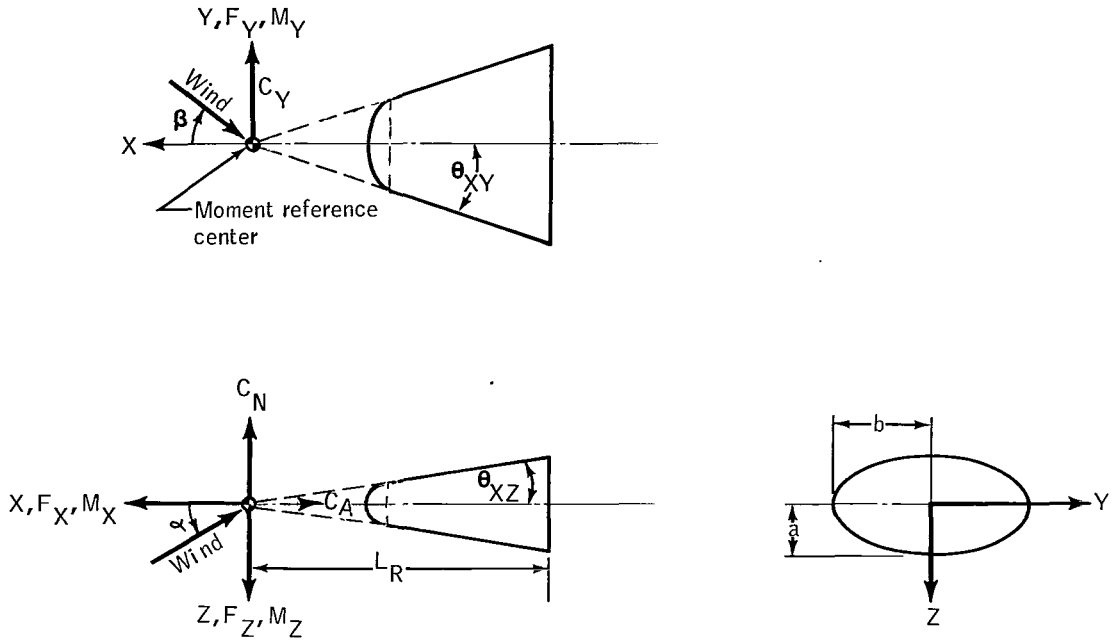
C_{Y_β}

m \ ξ	0	25	50	75	100
0.25	-0.0007	-0.0006	-0.0006	-0.0005	-0.0003
0.50	-0.0025	-0.0025	-0.0022	-0.0018	-0.0012
0.75	-0.0054	-0.0052	-0.0047	-0.0038	-0.0026
1.00	-0.0087	-0.0085	-0.0076	-0.0063	-0.0044
1.50	-0.0160	-0.0155	-0.0141	-0.0118	-0.0085
2.00	-0.0227	-0.0221	-0.0203	-0.0172	-0.0129
2.50	-0.0285	-0.0277	-0.0256	-0.0221	-0.0172
3.00	-0.0332	-0.0324	-0.0302	-0.0264	-0.0211

C_{n_β}

m \ ξ	0	25	50	75	100
0.25	0.0217	0.0216	0.0210	0.0193	0.0159
0.50	0.0221	0.0220	0.0213	0.0196	0.0163
0.75	0.0226	0.0225	0.0219	0.0201	0.0168
1.00	0.0232	0.0232	0.0225	0.0208	0.0174
1.50	0.0248	0.0248	0.0241	0.0224	0.0191
2.00	0.0265	0.0264	0.0258	0.0242	0.0210
2.50	0.0281	0.0280	0.0274	0.0259	0.0229
3.00	0.0295	0.0294	0.0289	0.0275	0.0247

NASA-S-66-1957 FEB 24



θ_{XY}, deg

θ_{XZ} / m	20°	30°	40°	50°	60°
.25	55.516	66.587	73.409	78.153	81.787
.50	36.052	49.107	59.210	67.240	73.898
.75	25.887	37.589	48.210	57.819	66.587
1.0	20.000	30.000	40.000	50.000	60.000
1.5	13.638	21.052	29.222	38.468	49.107
2.0	10.314	16.102	22.760	30.791	40.894
2.5	8.283	13.004	18.554	25.488	34.716
3.0	6.917	10.893	15.626	21.666	30.001

Figure 1.- Blunted elliptical cone.

NASA-S-66-1962 FEB 24

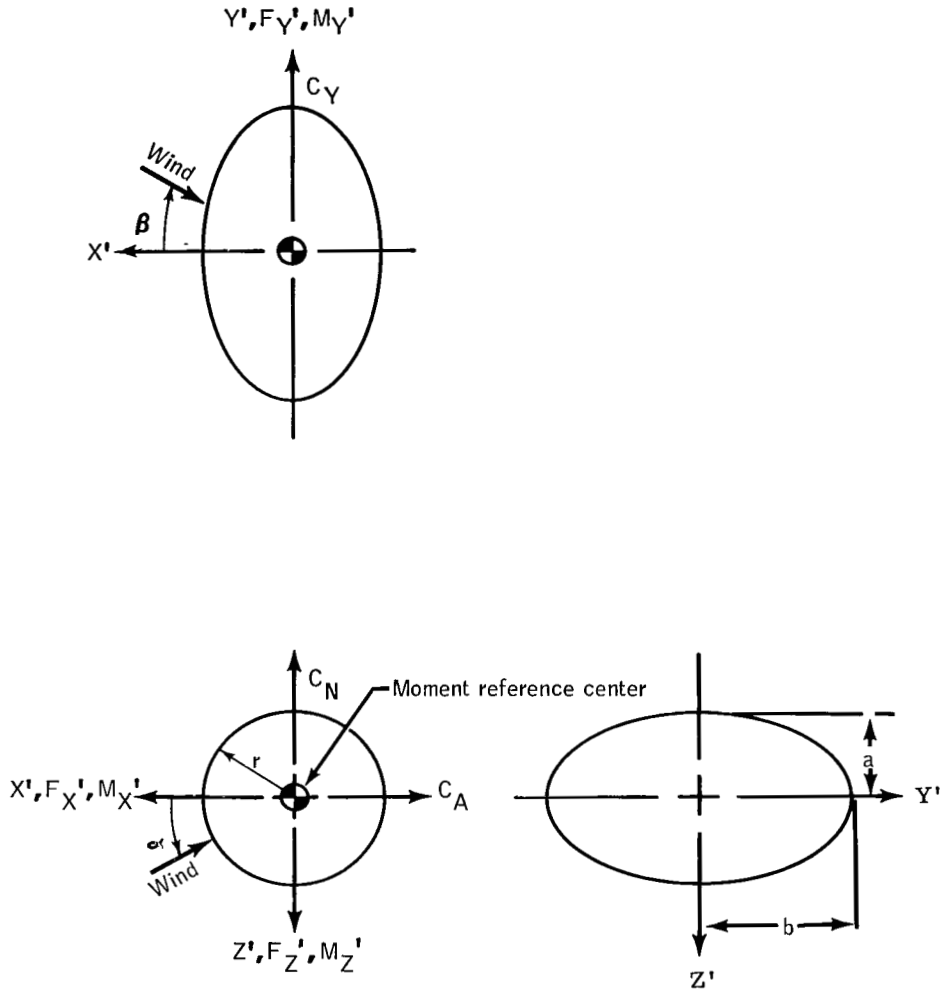


Figure 2. - Prolate spheroid.

NASA-S-66-1956 FEB 24

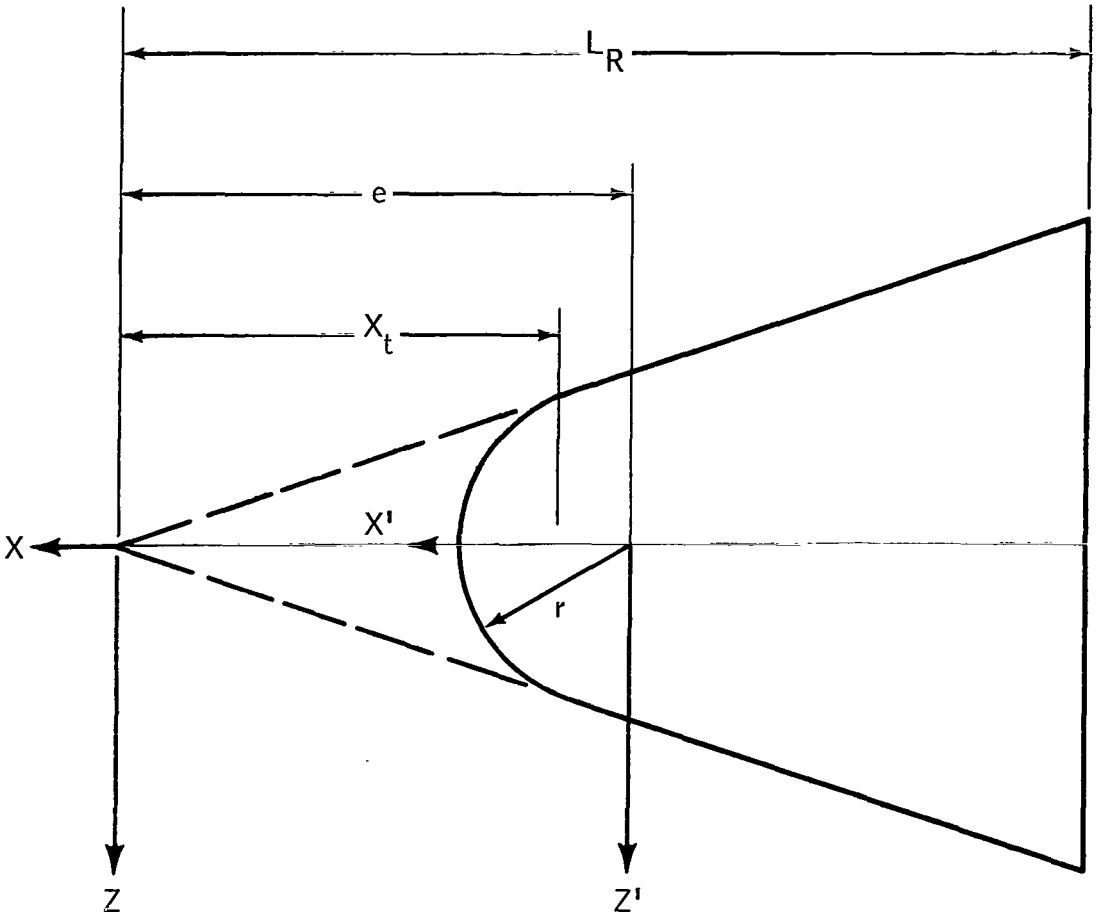
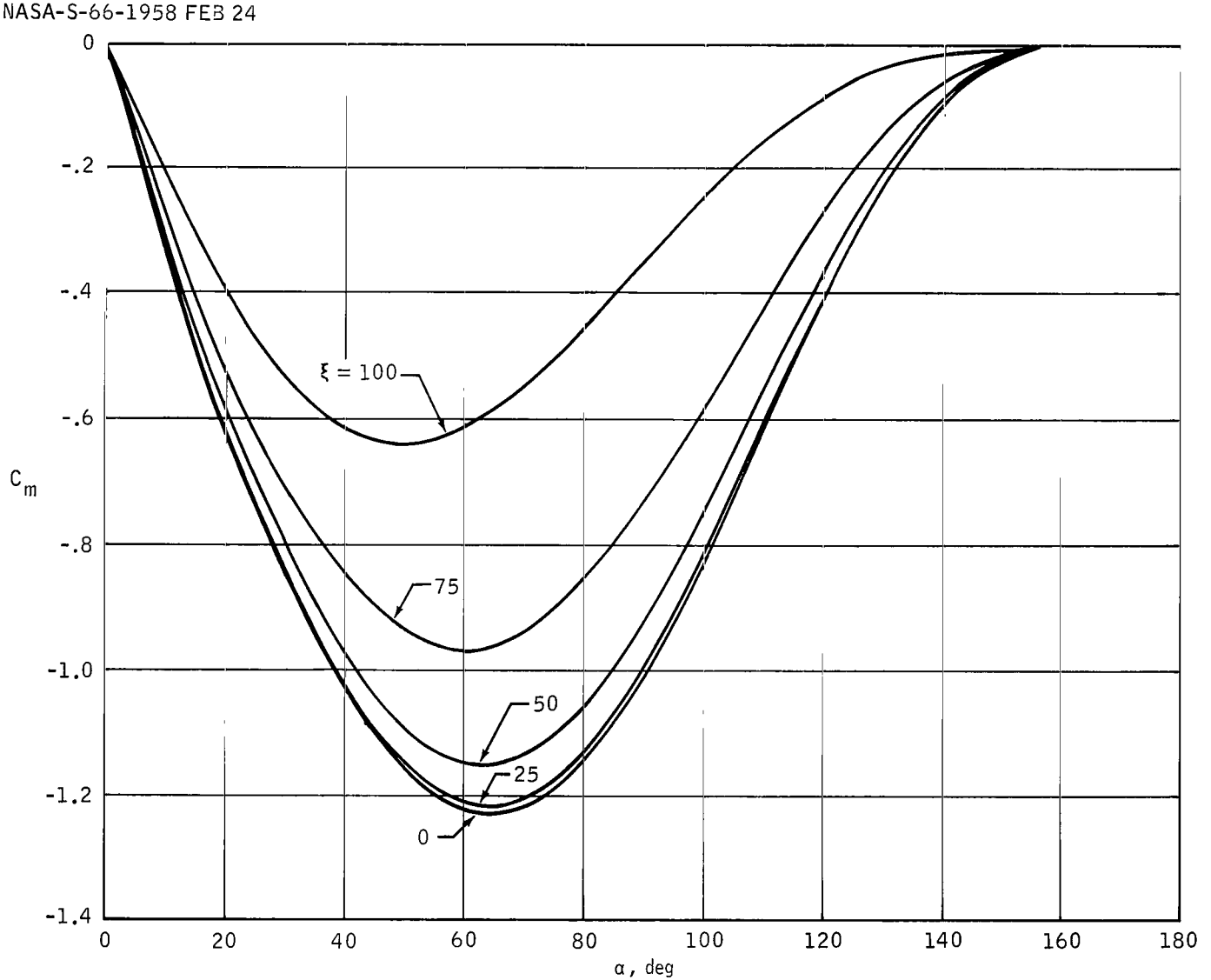


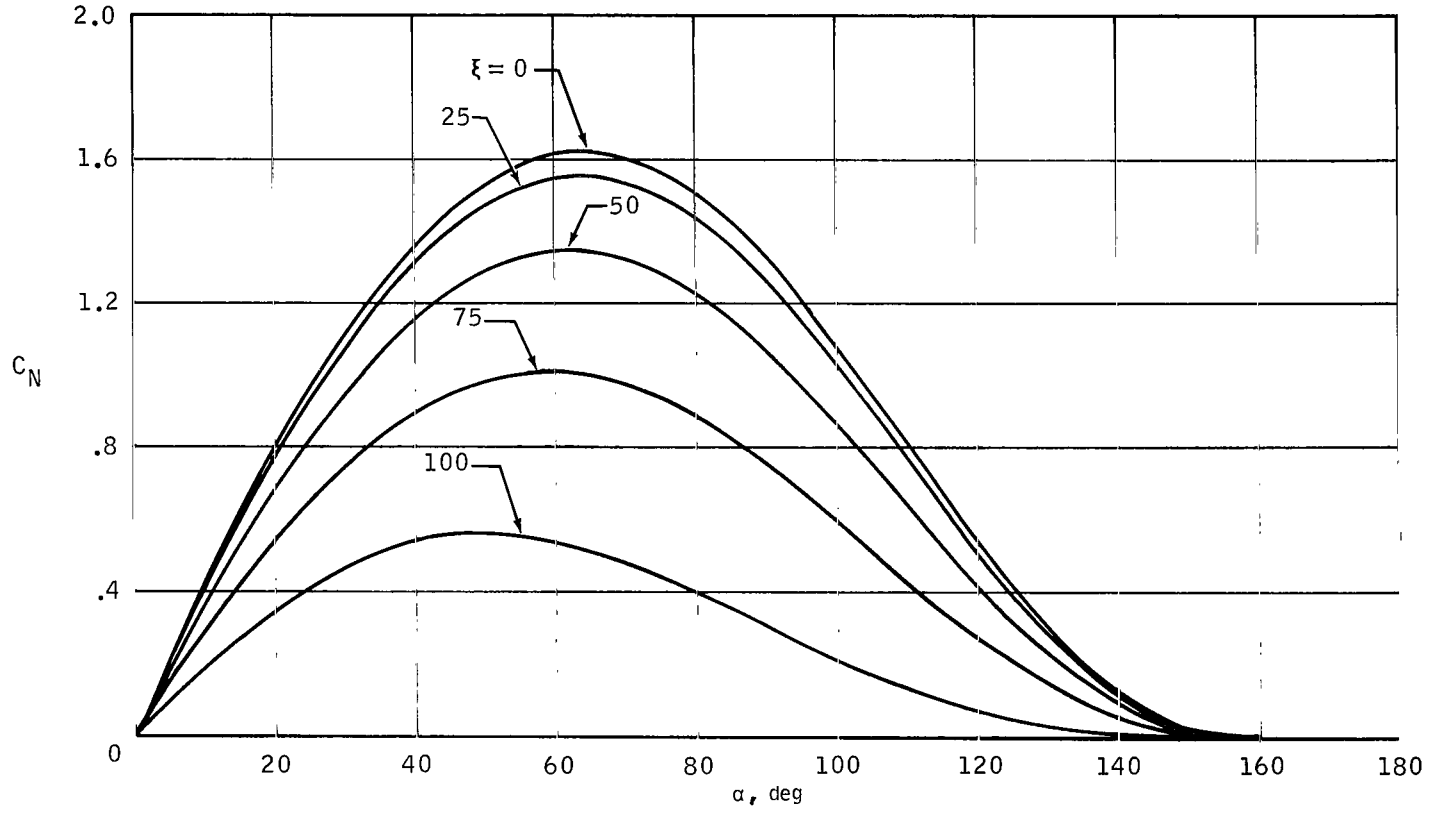
Figure 3. - Spheroid and cone axes relationship.



(a) C_m against α.

Figure 4. - Newtonian static longitudinal aerodynamics of blunted elliptical cone with m = 1/4 and $\Theta_{XZ} = 20°$.

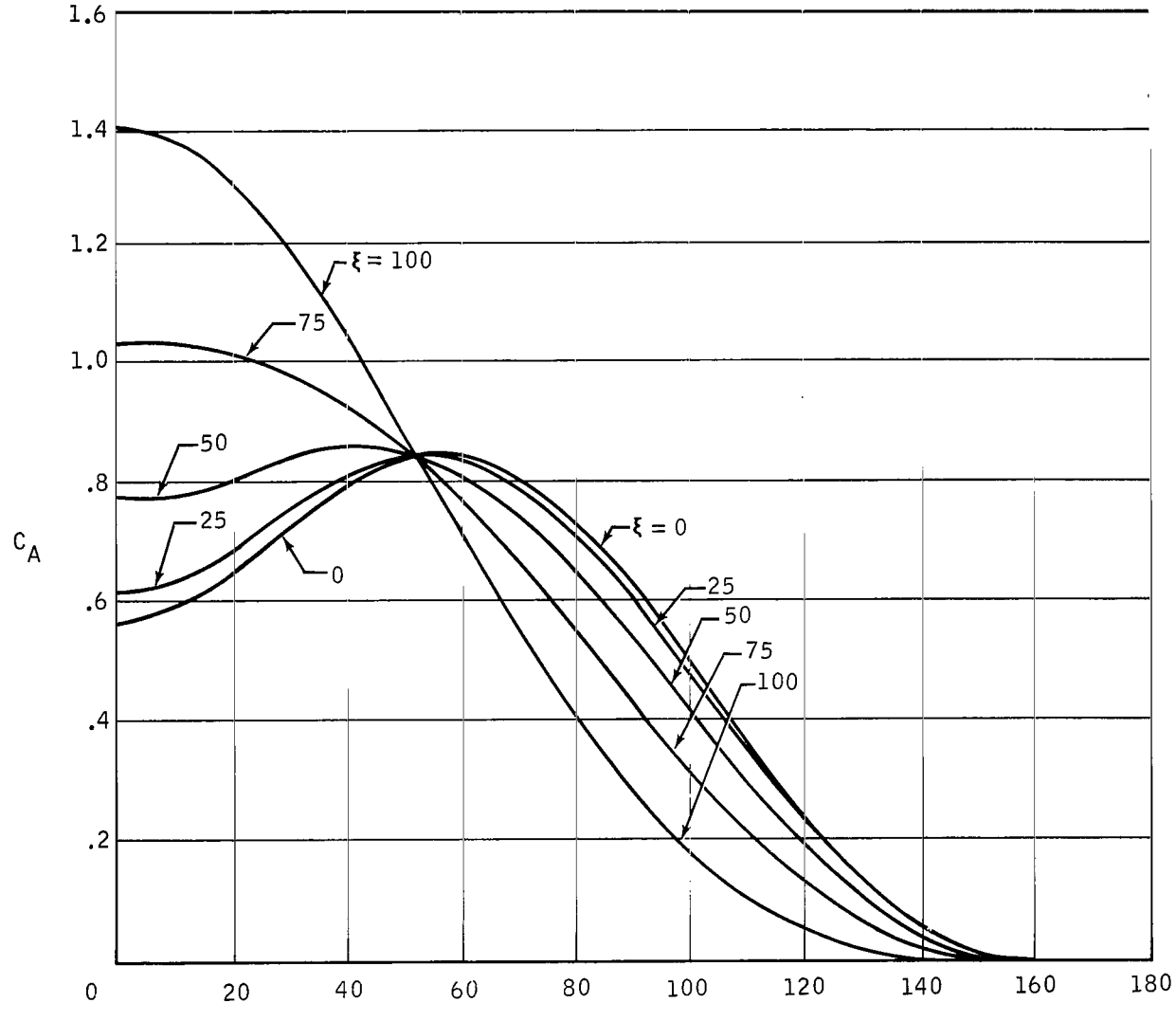
NASA-S-66-1961 FEB 24



(b) C_N against α.

Figure 4. - Continued.

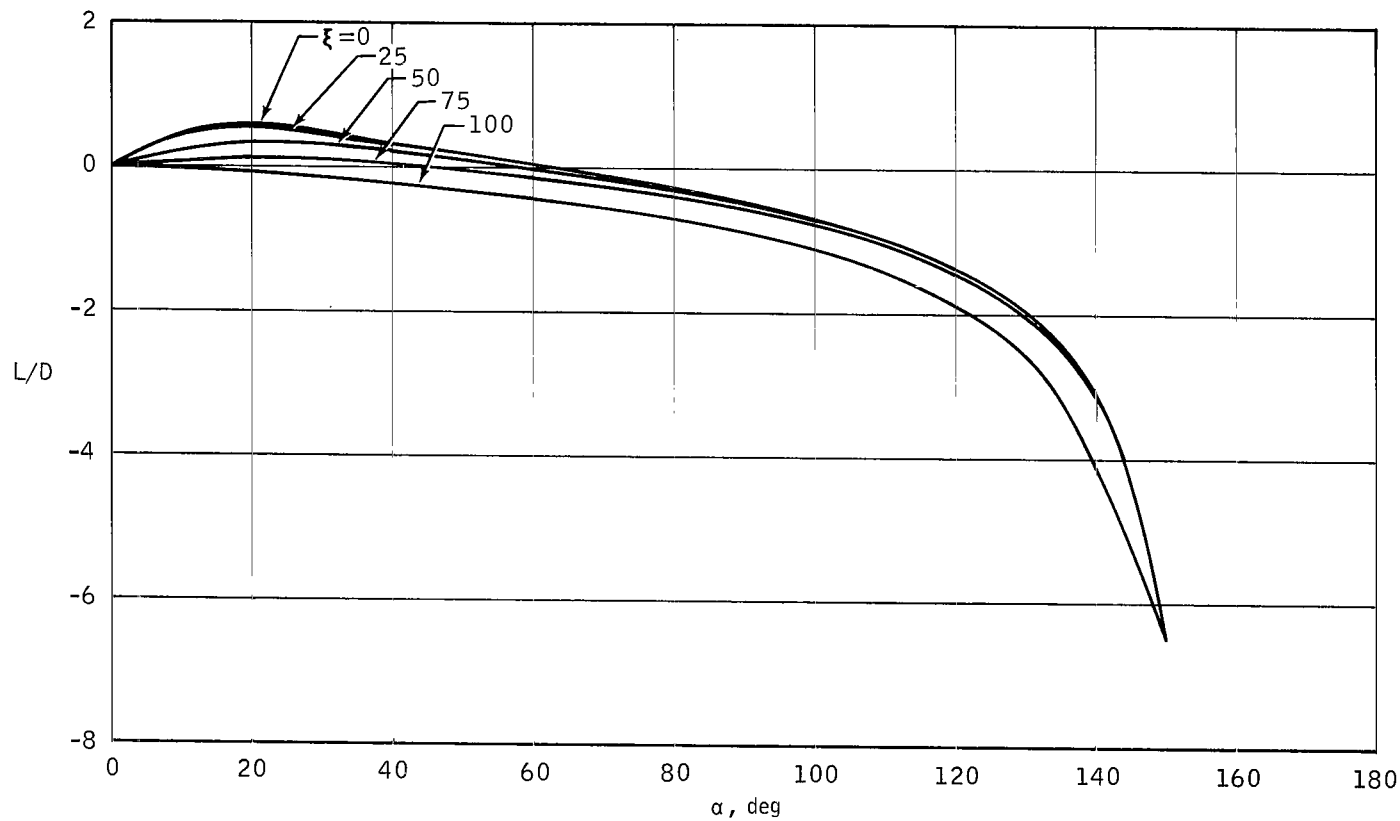
NASA-S-66-1959 FEB 24



(c) C_A against α.

Figure 4. - Continued.

NASA-S-66-1960 FEB 24



(d) L/D against α.

Figure 4. - Concluded.

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